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COAST GUARD

Efforts to Identify Arctic Requirements Are Ongoing, but More Communication about Agency Planning Efforts Would Be Beneficial



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Highlights of [GAO-10-870](#), a report to congressional requesters

Why GAO Did This Study

The retreat of Arctic sea ice combined with expected increasing human activity in the area—in shipping traffic and oil and gas exploration—has increased the strategic interest that the United States and other nations have in the Arctic. As a result, the Coast Guard is expected to acquire increased responsibilities in the region. GAO was asked to examine the extent to which the Coast Guard is:

(1) coordinating with stakeholders on Arctic issues and operations and what, if any, further opportunities exist to enhance coordination; (2) taking action to identify requirements for future Arctic operations; and (3) taking steps to identify and mitigate challenges to meet current and future Arctic requirements. GAO reviewed Coast Guard documents that described efforts to plan for increased Arctic activity. GAO conducted a site visit to Alaska and interviewed federal officials, Alaska state officials, Alaska Native stakeholders, as well as private or nonprofit organizations representing Arctic interests. These observations are not generalizable, but provided insights on Coast Guard activities and actions.

What GAO Recommends

GAO recommends that the Coast Guard communicate with key stakeholders on the process and progress of its Arctic planning efforts. DHS concurred with our recommendation.

View [GAO-10-870](#) or key components. For more information, contact Stephen L. Caldwell at (202) 512-9610 or caldwells@gao.gov.

COAST GUARD

Efforts to Identify Arctic Requirements Are Ongoing, but More Communication about Agency Planning Efforts Would Be Beneficial

What GAO Found

The Coast Guard coordinates with an array of stakeholders—foreign, federal, state, and local governments; Alaska Native interest groups; and private and nonprofit entities—on Arctic policy and operational issues, but some stakeholders want more information on the agency's Arctic planning efforts. Many local and Alaska Native officials praised the Coast Guard's coordination efforts on its summer Arctic operations, for example. However, 9 of the 15 state and local officials GAO met with wanted more information on the status and results of the Coast Guard's efforts to develop its future Arctic requirements. For example, some state and local officials believed that the agency had already determined its plan for Arctic operations but had not shared it, and one state official reported that his office and others may be willing to invest in infrastructure that could benefit the Coast Guard if and when they know the agency's plans. Coast Guard officials told us that they have been focused on communication with congressional and federal stakeholders and intend to share Arctic plans with other stakeholders once determined. In the interim, some state and local stakeholders reported having limited information that they believe would be useful on the process and progress of the agency's Arctic planning efforts. As a result, the Coast Guard could be missing an opportunity to create shared expectations and report on its progress with stakeholders central to future Arctic operations.

The Coast Guard has taken specific action to identify Arctic requirements and gaps while also collecting relevant information from routine operations. The High Latitude Study is the centerpiece of the agency's efforts to determine its Arctic requirements. The Coast Guard has also established temporary operating locations in the Arctic and conducted biweekly Arctic overflights to obtain more information on the Arctic operating environment. In addition, information gathered during the Coast Guard's routine missions—ice breaking, search and rescue, and others—also informs requirements. The agency's preliminary efforts to identify its Arctic requirements generally align with key practices for agencies defining missions and desired outcomes.

The Coast Guard faces Arctic challenges including limited information, minimal assets and infrastructure, personnel issues, and difficult planning and funding decisions, but is taking initial steps to address these challenges. Specifically, the Coast Guard does not currently have Arctic maritime domain awareness—a full understanding of variables that could affect the security, safety, economy, or environment in the Arctic—but is acquiring additional Arctic vessel tracking data, among other things, to address this issue. In addition, the Coast Guard's Arctic assets and infrastructure are limited and not suitable for the harsh environment, but the agency is testing equipment and using alternative options to mitigate gaps. Finally, the Coast Guard faces uncertainty over the timing of predicted environmental changes in the Arctic, as well as over future funding streams. To address these challenges the Coast Guard obtains scientific data on Arctic climate change and is studying its Arctic resource requirements to support potential future funding needs.

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Abbreviations

AIS	Automatic Information System
BOEMRE	Bureau of Ocean Energy Management, Regulation and Enforcement
CMTS	Committee on the Marine Transportation System
DHS	Department of Homeland Security
DOD	Department of Defense
DOT	Department of Transportation
EEZ	Exclusive Economic Zone
FMP	Fishery Management Plan
IMO	International Maritime Organization
NOAA	National Oceanic and Atmospheric Administration
NSF	National Science Foundation
NSIDC	National Snow and Ice Data Center
NSPD-66/HSPD-25	National Security Presidential Directive 66/Homeland Security Presidential Directive 25
UNCLOS	United Nations Convention on the Law of the Sea
USARC	United States Arctic Research Commission

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United States Government Accountability Office
Washington, DC 20548

September 15, 2010

The Honorable Bennie G. Thompson
Chairman
Committee on Homeland Security
House of Representatives

The Honorable Don Young
House of Representatives

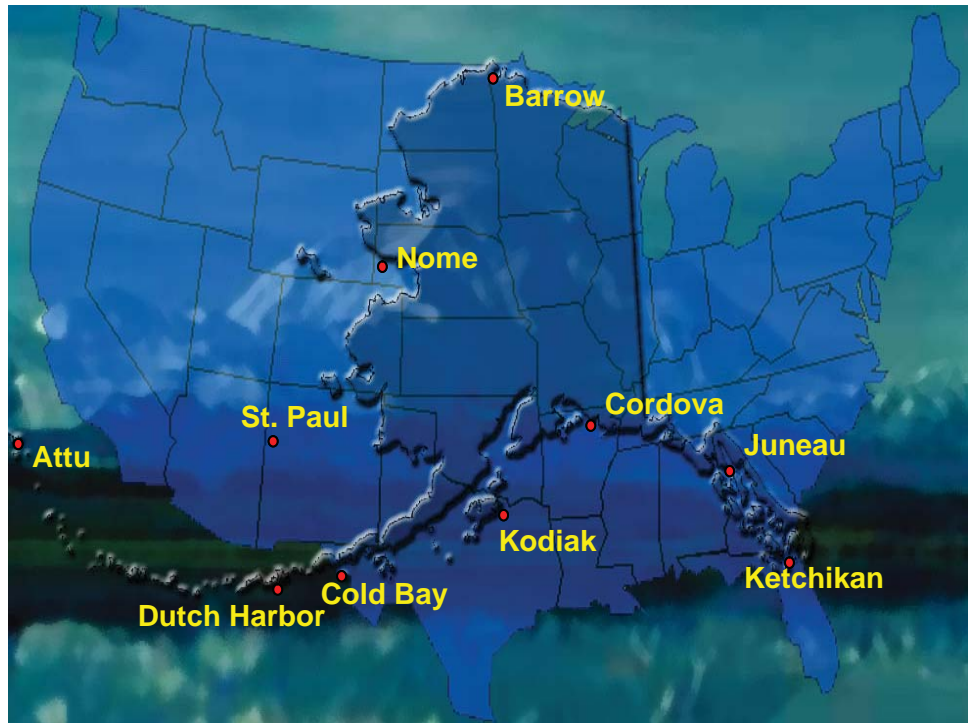
The retreat of sea ice combined with an expected increase in human activity—shipping traffic and oil and gas exploration—has increased the strategic interest that the United States and other nations have in the Arctic region. The region’s strategic value was further underscored by a 2008 United States Geological Survey study which stated that the extensive Arctic continental shelves may constitute the world’s largest unexplored prospective area for petroleum.¹ As a result of these and other anticipated changes in the Arctic, the U.S. Coast Guard is expected to face increasing responsibilities in the waters off of Alaska’s 44,000 miles of coast. According to Coast Guard officials, some of the Coast Guard’s 11 statutory missions will take on particular importance including Fisheries Enforcement, Search and Rescue, Marine Environmental Protection, and Aids to Navigation mission areas. In addition, the Coast Guard, through the Department of Homeland Security (DHS), has been tasked with specific Arctic policy objectives set forth in National Security Presidential Directive 66/ Homeland Security Presidential Directive 25 (NSPD-66/HSPD-25)—a January 2009 directive which outlines national Arctic policy and tasks senior officials, including the Secretary of Homeland Security, with its implementation. The Coast Guard currently has limited capacity to operate in the waters below the Arctic Circle—the Bering Sea and the Aleutian Chain—and increasing responsibilities in an even larger geographic area, especially in the harsh and remote conditions of the

¹ U.S. Geological Survey Fact Sheet 2008-3049, “Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle” (July 23, 2008).

northern Arctic, will further stretch the agency's capacity.² Presently, all of the Coast Guard's assets are based well below the Arctic Circle, so Coast Guard operations above the Arctic Circle are constrained by several factors, including the time required for surface vessels and aircraft to cover vast distances to reach the Arctic Circle. When the Coast Guard is able to respond to an incident, its surface and air assets are limited by fuel capacity and the distance to fuel sources. As a result, Coast Guard cutters (non icebreakers) and aircraft are only able to operate for a few days or a few hours on scene before returning for fuel. Figure 1 compares the State of Alaska to the lower 48 states to illustrate the large distances between, for example, Kodiak (the Coast Guard's northernmost air station) and Point Barrow (the northernmost point of land in Alaska).

² All Arctic stakeholders do not define the Arctic geographical area the same way. Federal law relating to Arctic research, for example, defines the Arctic as all U.S. and foreign territory north of the Arctic Circle and all U.S. territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwin Rivers [in Alaska]; all contiguous seas including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian Chain. Pub. L. No. 98-373, 98 Stat. 1248 (1984). For the purposes of this report, we are limiting our analysis to a more specific definition of the Arctic—the more remote region above the Arctic Circle.

Figure 1: Map of the State of Alaska Superimposed on the Lower 48 States



Source: Coast Guard.

The Coast Guard has started exploring how to manage these and other challenges to Arctic operations and we were asked to review the agency's initial efforts to prepare for increasing Arctic activity. Specifically, this report addresses the extent to which the Coast Guard is: (1) coordinating with stakeholders on Arctic issues and operations and what, if any, further opportunities exist to enhance coordination; (2) taking action to identify its requirements for future Arctic operations; and (3) taking steps to identify and mitigate Arctic challenges to meet current and future Arctic requirements.

To gather information for all three objectives we interviewed public and private sector representatives with Arctic operations or interests on: stakeholder coordination; Coast Guard action to identify future requirements; and Coast Guard efforts to overcome Arctic-related challenges. Specifically, we

-
- interviewed headquarters-based officials from the Coast Guard and other federal entities—National Science Foundation (NSF), U.S. Arctic Research Commission, and the Departments of State, Defense, and Commerce, among others;
 - conducted a site visit to Alaska to interview field-based officials from the Coast Guard and six other federal departments and agencies with operations in the Arctic, three Alaska state departments, one Alaska Native interest group, and six private or nonprofit organizations representing various Arctic interests; and
 - conducted additional interviews by phone and in person with representatives from other federal, state, local, Alaska Native, and private and nonprofit sector stakeholders and the International Maritime Organization (IMO).

To determine the extent to which the Coast Guard is coordinating with Arctic stakeholders and if additional coordination opportunities exist, we interviewed the above noted stakeholders due to their presence or involvement in the Arctic, reported interaction with the Coast Guard, and based on the recommendations of other Arctic stakeholders. Since we selected a nonprobability sample of Arctic stakeholders, the information obtained from these interviews cannot be generalized to all stakeholders but does provide for a broad overview of the types of Coast Guard coordination taking place on Arctic issues. We also reviewed documentation of the Coast Guard's Arctic coordination such as memorandums of understanding, Coast Guard records of contact with Alaska Native interest groups, and after-action reports. To assess the Coast Guard's interagency coordination on Arctic policy issues we identified how, if at all, each effort aligned with key practices we have identified for enhancing and sustaining interagency coordination. We also reviewed the Coast Guard's interagency coordination efforts against criteria in *Standards for Internal Control in the Federal Government* related to effective characteristics of program management.³ We did not evaluate the effectiveness of each interagency coordination effort but simply identified the key practices each effort is structured to address.

³ GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

To determine the steps that the Coast Guard is taking to identify its future Arctic requirements we interviewed headquarters officials, as well as field-based Coast Guard District and Sector officials responsible for all Coast Guard operations in the state of Alaska.⁴ We also interviewed the above noted stakeholders to obtain their views on Coast Guard actions and their role in helping the Coast Guard determine its Arctic mission requirements. We also reviewed Coast Guard documentation of its efforts to plan for increased Arctic activity, including documents pertaining to the agency's ongoing analysis of current and future Arctic mission requirements and after-action reports. We reviewed our prior work on key steps and critical practices to implement the Government Performance and Results Act of 1993⁵ and determined how the Coast Guard's preliminary planning efforts align with these.

To determine the extent to which the Coast Guard is taking steps to identify and mitigate Arctic challenges to meet current and future Arctic requirements, we interviewed headquarters and field-based Coast Guard officials to discuss the Arctic operating environment, challenges to the Coast Guard's Arctic activities, and steps being taken to mitigate these challenges. We also reviewed Coast Guard documents such as after-action reports and reports to Congress, as well as federal and international research reports to distill additional challenges and factors impacting the Coast Guard's Arctic operations.

We conducted this performance audit from September 2009 to September 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings

⁴ Coast Guard Sectors run all missions at the local and port level, such as search and rescue, port security, environmental protection, and law enforcement in ports and surrounding waters, and oversee a number of smaller Coast Guard units, including small cutters, small boat stations, and Aids to Navigation teams. Coast Guard Districts oversee Sectors, other Coast Guard units, such as Air Stations, and major buoy tenders, among other assets. Sector Anchorage has the largest geographical area of responsibility in the nation, which includes the North Slope, Bering Sea, Chukchi Sea, Bristol Bay (with the world's largest run of sockeye salmon), Kodiak Island, Kenai Peninsula, and the Aleutian Islands.

⁵ Pub. L. No. 103-62, 107 Stat. 285 (1993).

and conclusions based on our audit objectives. See appendix I for a more detailed description of our scope and methodology.

Background

Receding Ice Opens Potential for Increased Commerce in the Arctic

Scientific explanations and projections of the changes taking place in the Arctic vary, but there is a general consensus that Arctic sea ice is diminishing. As recently as August 2010 scientists at the U.S. National Snow and Ice Data Center reported that the average Arctic sea ice extent for July was the second lowest in the satellite record.⁶ Much of the Arctic Ocean remains ice-covered for a majority of the year, but some scientists have projected that the Arctic will be ice-diminished in the summer by as soon as 2040.⁷

These environmental changes in the Arctic are making maritime transit more feasible and are increasing the likelihood of human activity including tourism, oil and gas extraction, commercial shipping, and fishing in the region. For example, a 2008 United States Geologic Survey study estimated that areas north of the Arctic Circle contained 90 billion barrels of oil; 1,700 trillion cubic feet of natural gas; and 44 billion barrels of natural gas liquid. Until May 2010, the Shell Oil Company was scheduled to begin exploratory drilling off the Northwest coast of Alaska in July of 2010.⁸ According to industry officials, such drilling operations could result in additional vessel activity in northern Alaska and the *Arctic Marine Shipping Assessment* also stated that future commercial shipping activities are likely to grow with the extraction of resources such as oil,

⁶ The National Snow and Ice Data Center (NSIDC) is part of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado at Boulder. NSIDC supports research into our world's frozen realms: the snow, ice, glaciers, frozen ground, and climate interactions that make up Earth's cryosphere. NSIDC manages and distributes scientific data, creates tools for data access, supports data users, performs scientific research, and educates the public about the cryosphere.

⁷ A Joint Coast Guard /U.S. Navy Statement on Arctic ice terminology supports usage of the term "ice diminished" rather than "ice free" because both agencies recognize that the region will continue to remain ice-covered during the wintertime through the end of this century and the current and projected decline in Arctic sea ice is highly variable from year to year.

⁸ The Department of Interior announced on May 27, 2010, that applications for permits to drill Shell's 5 wells will not be considered until 2011 because of the need for further information-gathering, evaluation of proposed drilling technology, and evaluation of oil spill response capabilities for Arctic waters.

gas, and ore. While resource extraction activities are expected to increase, commercial fishing will likely not occur above the Arctic Circle in the near term due to a U.S. decision in November 2009 to close 150,000 square nautical miles of U.S. Arctic waters to commercial fishing until sufficient information is available to support the sustainable management of a commercial fishery.⁹

Varying Definitions of the Arctic Are Used

Not all Arctic stakeholders define the “Arctic” geographical area the same way. The U.S. Arctic Research and Policy Act of 1984 defines the term “Arctic” broadly to include the Bering Sea and Aleutian Chain, while others define the “Arctic” more narrowly as the area above the Arctic Circle. The broader definition of the Arctic adds about 2 million square kilometers of territory not included in the narrower definition of the Arctic. Figure 2 illustrates the Arctic boundary as defined by the Arctic Research and Policy Act and also shows the Arctic Circle line of latitude.

⁹ This decision was contained in a final rule that implements the Fishery Management Plan (FMP) for Fish Resources of the Arctic Management Area and Amendment 29 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs. The Arctic FMP and Amendment 29 to the Crab FMP establish sustainable management of commercial fishing in the Arctic Management Area and move the northern boundary of the Crab FMP out of the Arctic Management Area south to the Bering Strait. 74 *Fed. Reg.* 56,734 (2009) (effective Dec. 3, 2009).

Figure 2: Map of the Arctic Boundary as Defined by the Arctic Research and Policy Act



Source: Created by the National Science Foundation for the U.S. Arctic Research Commission.

International Conventions and Organizations Facilitate International Collaboration in the Arctic

There are several international conventions and organizations that guide international collaboration in the Arctic. One of the key Conventions—the United Nations Convention on the Law of the Sea (UNCLOS)—has become the subject of greater focus as Arctic sea ice diminishes. UNCLOS, which entered into force in November 1994, addresses all aspects of ocean space including, among other things, economic and commercial activities, environmental control, and settlement of disputes relating to ocean matters for those countries that have ratified the convention. In general, UNCLOS provides that any coastal nation that has acceded to the Convention can make a claim to certain continental shelf rights including oil and gas that are discovered on its continental shelf beyond its 200 nautical mile Exclusive Economic Zone (EEZ).¹⁰ An UNCLOS

¹⁰ Under UNCLOS, an EEZ is a maritime zone beyond and adjacent to the territorial sea that may not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. Within the EEZ, the coastal state has sovereign rights for the purpose of exploring, exploiting, conserving, and managing natural resources, both living and nonliving, of the seabed, subsoil, and the superjacent waters and, with regard to other activities, for the economic exploitation and exploration of the zone (e.g., the production of energy from the water, currents, and winds).

subcommittee is to consider and approve nations' outer continental shelf land claims. However, the United States has signed but not ratified this Convention and therefore is not able to submit claims under the convention's provisions at this time.

Since 1996, international Arctic cooperation has taken place in the Arctic Council, an organization of the eight Arctic states (United States, Canada, Denmark, Finland, Iceland, Norway, Russia, and Sweden), six Permanent Participant groups (indigenous peoples' organizations), and observers which include international organizations, nongovernmental organizations, and non-Arctic states.¹¹ The council and its bodies focus on environmental and sustainable development issues, but the council has no regulatory authority or treaty responsibilities. However, the council does issue guidelines for Arctic operations and studies such as the *Arctic Marine Shipping Assessment*. In addition to the Arctic Council, the International Maritime Organization (IMO) has adopted broad mandatory safety guidelines, as well as more specific voluntary guidelines for ships transiting the Arctic.¹²

The United States Has Regulations and Policies That Govern Arctic Operations

The United States has obligations that apply to Arctic operations including overarching national policies, as well as more specific maritime policies and authorities. NSPD-66/HSPD-25 reflects current U.S. Arctic policy and is therefore key among these policies. The Coast Guard's role in the Arctic was implicated in this directive, which acknowledges the effects of climate change and increased human activity in the Arctic region, lays out specific policy objectives and federal partners, and reaffirms the importance of Alaska Native consultation in policy decisions.¹³ In addition to NSPD-

¹¹ The Ottawa Declaration of 1996 formally established the Arctic Council as a high-level intergovernmental forum. The Ottawa Declaration was a political declaration signed in Ottawa by representatives of the governments of Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russian Federation, Sweden, and the United States.

¹² The IMO is a United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.

¹³ The directive spells out six policy objectives: (1) meet national security and homeland security needs relevant to the Arctic region; (2) protect the Arctic environment and conserve its biological resources; (3) ensure that natural resource management and economic development in the region are environmentally sustainable; (4) strengthen institutions for cooperation among the eight Arctic nations; (5) involve the Arctic's indigenous communities in decisions that affect them; and (6) enhance scientific monitoring and research into local, regional, and global environmental issues.

66/HSPD-25, Executive Order 13175 also plays a key role in U.S. Arctic operations. Executive Order 13175 requires federal agencies to involve Indian tribal governments, such as certain Arctic indigenous communities in Alaska, in decisions that affect them.¹⁴ Finally, since the Arctic region is primarily a maritime domain, existing policies and authorities relating to maritime areas continue to apply.

The Coast Guard Is the Primary Federal Maritime Agency in the Arctic, but Multiple Stakeholders Also Have Arctic Responsibilities

Since the Arctic is primarily a maritime domain, the Coast Guard plays a significant role in Arctic policy implementation and enforcement. The Coast Guard is a multimission, maritime military service within the DHS that has responsibilities including maritime safety, security, environmental protection, and national defense, among other missions.¹⁵ Therefore, as more navigable ocean water emerges in the Arctic and human activity increases, the Coast Guard will face expanding responsibilities in the region. Other federal agencies also have responsibilities in the Arctic. See table 1 for other key federal agencies and their roles in the Arctic.

Table 1: Key Federal Agencies Also Operating in the Arctic

Federal agency	Arctic responsibilities
Department of Commerce’s National Oceanic and Atmospheric Administration (NOAA)	NOAA (1) provides information on Arctic oceanic and atmospheric conditions (such as clouds, atmospheric temperature, tides, currents, bathymetry, and ice conditions); (2) issues weather and ice forecasts; (3) provides fisheries management and enforcement; (4) is responsible for the protection of endangered marine species, habitat restoration, and natural resource damage assessment (such as after oil spills); (5) develops and maintains nautical charts; (6) provides information on the climate; and (7) is responsible for the protection of marine mammals, including participation in co-management activities with Alaska Native organizations for species that are the focus of subsistence harvests.

¹⁴ On March 1, 2010, DHS published *A Plan to Develop a Tribal Consultation and Coordination Policy Implementing Executive Order 13175*, which recognizes that to increase internal communication and collaboration, it is imperative that DHS have staff dedicated to working with, and improving, relations with the 229 federally recognized tribes in Alaska.

¹⁵ The Coast Guard’s 11 statutory missions are (1) ports, waterways, and coastal security; (2) migrant interdiction; (3) defense readiness; (4) drug interdiction; (5) other law enforcement; (6) search and rescue; (7) living marine resources; (8) Aids to Navigation; (9) ice operations; (10) marine environmental protection; and (11) marine safety.

Federal agency	Arctic responsibilities
Department of Defense (DOD)	DOD is responsible in the Arctic and elsewhere for securing the United States from direct attack; securing strategic access and retaining global freedom of action; strengthening existing and emerging alliances and partnerships; and establishing favorable security conditions. DOD is responsible for underwater navigation and some vessel tracking. Additionally, the Navy has developed an “Arctic Roadmap” which lists Navy action items, objectives, and desired effects for the Arctic region from fiscal year 2010 to 2014. Focus areas include training, communications, operational investments, and environmental protection.
Department of the Interior’s Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE)	BOEMRE is responsible for approving leases for resource development projects in Arctic waters; oversight and regulation of offshore oil and gas operations; review and approval of oil spill response plans; and verification of operational and response capabilities. The bureau also funds ocean research through the Environmental Studies Program to provide science in support of management decisions.
Department of State (State Department)	State Department is responsible for formulating and implementing U.S. policy on international issues concerning the oceans, the Arctic, and Antarctica. The department also leads the domestic interagency Arctic Policy Group and U.S. participation in the Arctic Council.
Department of Transportation (DOT)	DOT provided financial support for the <i>Arctic Marine Shipping Assessment</i> and one of DOT’s component agencies, the Maritime Administration, works on Arctic transportation and shipping issues, among other things.
National Science Foundation (NSF)	NSF is responsible for funding U.S. Arctic research—including research on the causes and impacts of climate change—and provides associated logistics and infrastructure support to conduct this research. NSF and the Coast Guard also coordinate on the use of the Coast Guard’s icebreakers for scientific research.
U.S. Arctic Research Commission (USARC)	USARC is responsible for, among other things, developing and establishing an integrated national arctic research policy that guides federal agencies in developing and implementing their Arctic research programs. In addition, USARC biennially publishes a “Report on Goals and Objectives for Arctic Research.”

Source: GAO.

State and local governments, Alaska Native tribal governments and other Alaska Native interest groups, private industry, and nonprofit groups are also important Arctic stakeholders. State government is involved in, among other things, Arctic fishery enforcement, oil spill planning and response, emergency management, and economic development. Local governments, Alaska Native tribal governments, and Alaska Native interest groups are in some cases the closest stakeholders to activities taking place in the Arctic. Consequently, the responsibility for responding to Arctic incidents often falls to local governments. For example, the North Slope Borough, which encompasses about 89,000 square miles of northern Alaska, maintains its own search and rescue capabilities including fixed and rotary wing aircraft. Additionally, Alaska Native communities have inhabited the Arctic region for thousands of years and have cultures that are particularly sensitive to changes in the environment due to subsistence lifestyles revolving around marine ecosystems. Finally, private sector and nonprofit groups are also important Arctic stakeholders. These groups

cover a wide spectrum of interests, including resource extraction companies, cruise lines, vessel tracking organizations, and conservation groups, among others. See appendix II for a description of some of the state, local, and Alaska Native Arctic stakeholders.

The Coast Guard Coordinates with Many Stakeholders but Some Want More Information on the Agency's Ongoing Arctic Planning and Future Approach

The Coast Guard Coordinates and Collaborates with Foreign Governments on Arctic Policy Issues

The Coast Guard has been actively involved in both multilateral and bilateral Arctic coordination efforts with foreign governments. The multilateral efforts have often concerned Arctic-wide operational issues while the bilateral efforts have related to specific operational issues between the United States and an Arctic neighbor. One example of a multilateral effort is the Coast Guard's role as the primary U.S. representative to the IMO for policy development. For the past few years the Coast Guard has advocated for IMO's voluntary *Guidelines for Ships Operating in Arctic-Ice Covered Waters* to be changed to mandatory requirements for ships operating in both Arctic and Antarctic waters to enhance maritime safety in the regions.¹⁶ In another example of multilateral collaboration, the Coast Guard participates in two Arctic

¹⁶ In December 2002, the IMO issued a set of voluntary guidelines for ships operating in Arctic ice-covered waters. The guidelines apply to passenger and cargo ships of 500 gross tonnage or more engaged in international voyages. They do not apply to fishing vessels, military vessels, pleasure yachts, and smaller cargo ships. The guidelines are intended to promote safety and prevent pollution in the Arctic, and they include provisions on ship construction, ship equipment related to navigation, crew training, and operation of the ship. For example, the guidelines require ships to carry fully enclosed lifeboats or to carry tarpaulins to cover their lifeboats and require the crew to include at least one ice navigator with documented evidence of having completed an ice navigation training program. The guidelines are currently being updated with a targeted completion date in 2010 though they would likely not be adopted until 2012.

Council working groups under the leadership of the State Department and is the U.S. Head of Delegation for the Council's Search and Rescue Task Force.¹⁷ In this role, the Coast Guard is the U.S. government lead in multilateral negotiations on a proposed SAR agreement among the eight Arctic Council nations to establish primary responsibility for aeronautical and maritime search and rescue services within the Arctic.

The Coast Guard has also engaged in bilateral coordination and collaboration with other Arctic nations. For example, since the summer of 2008 the Coast Guard has collaborated with the Canadian Coast Guard on joint extended continental shelf surveys in support of the State Department-led interagency Extended Continental Shelf Task Force. During these joint expeditions one U.S. and one Canadian icebreaker have conducted joint extended continental shelf survey expeditions to collect seismic and bathymetric data that both countries could use as the foundation for potential future extended continental shelf land claims in the Arctic.¹⁸ According to the Extended Continental Shelf Task Force, this collaboration between the United States and Canada saves millions of dollars for both nations, provides data both nations need, ensures that data are collected only once in the same area, and increases scientific and diplomatic cooperation. Figure 3 shows these two icebreakers working together on a mapping cruise in September 2009. In July 2010 the State Department announced plans to conduct this joint operation again in 2010.

¹⁷ The Arctic Council's Search and Rescue Task Force was formed in April 2009 with a mandate to develop a SAR agreement for the Arctic and has been asked to finalize the agreement in time to be presented for adoption by the Arctic Council at its Ministerial meeting in spring 2011.

¹⁸ Since 2003, the United States has been gathering and analyzing seismic and bathymetric data to determine its extended continental shelf. Bathymetric data provide a three-dimensional map of the ocean floor. Seismic data provide a cross-section view of what is beneath the ocean floor. From that cross-view, scientists can derive information on the depth, thickness, geometry, and other characteristics of the geological layers stacked on top of one another.

Figure 3: U.S. Coast Guard's *Healy* and the Canadian Coast Guard's *Louis S. St. Laurent* on a Joint Mission in the Arctic



Source: Coast Guard.

Another example of the Coast Guard's bilateral coordination and collaboration with the Canadian government is the Joint Marine Pollution Contingency Plan for Canada and the United States. This plan was designed to enhance cooperation and standardize response procedures between the two nations with respect to an oil or hazardous substance release. The two countries have conducted joint tabletop exercises of the plan five times since 1998 and most recently in Anchorage in March 2010.

The purpose of this latest exercise—entitled CANUSNORTH 2010—was to simulate a joint response to an oil spill on the United States-Canada border in the Arctic. The Coast Guard also has a long-standing collaborative relationship with the Russian Border Guard.¹⁹ Coast Guard District 17 officials told us that they exchange visits with Russian Border Guard officials every 6 months in an effort to facilitate communication between the United States and Russia, particularly on fisheries and increasingly on Arctic issues. According to the Coast Guard District 17 Commander, communication between the two countries has improved as a result. For example, in May 2009, when Alaska Native hunters crossed the maritime boundary into Russia, the Coast Guard and Russian Border Guard worked cooperatively to ensure the hunters returned safely to the United States. The two countries have also worked cooperatively to respond to illegal fishing along the maritime boundary between the United States and Russia in the Bering Sea.

The Coast Guard Coordinates with Federal Agencies on Arctic Operations and Uses Key Practices to Collaborate on Arctic Policy

The Coast Guard coordinates with other federal agencies to leverage federal resources and expertise for Arctic operations. Officials at all nine of the federal agencies we met with reported partnering with the Coast Guard on Arctic operations—although some were much more involved with Coast Guard Arctic operations than others. For example, NOAA, as the federal authority on oceanic and atmospheric data, reported providing the Coast Guard with aviation, surface, and marine weather forecasts and warnings; nautical charts and real-time oceanographic data (such as ice concentration and type); and satellite-aided data—information which, according to Coast Guard officials, is critical to the Coast Guard’s search and rescue operations.²⁰ In addition, officials at NOAA’s National Marine Fisheries Service reported collaborating with the Coast Guard on oversight and enforcement of Arctic fisheries. The Coast Guard also collaborates with NSF to manage the nation’s icebreaker fleet, including

¹⁹ More specifically, the Coast Guard has a long-standing relationship with the Northeast Border Guard Directorate of the Federal Security Service of Russia—a Russian counterpart to the Coast Guard—which is tasked with guaranteeing the safety of marine routes and coastal waters of the Russian Federation.

²⁰ NOAA, Coast Guard, U.S. Air Force, and the National Aeronautics and Space Administration signed a Memorandum of Agreement, *Interagency Memorandum of Agreement for the United States Satellite-Aided Search and Rescue System*, effective as of February 25, 2010. The memorandum supersedes agreements signed in 1998 and 2003.

scheduling icebreaker time for research activities.²¹ Appendix III describes additional examples of the Coast Guard's operational coordination with other federal Arctic stakeholders.

The Coast Guard is also involved in several interagency coordination efforts relating to Arctic policy that address aspects of key practices we have previously identified to help enhance and sustain collaboration among federal agencies. Our previous work has shown that federal agencies can enhance and sustain their collaborative efforts by engaging in eight key practices: (1) define and articulate a common outcome; (2) establish mutually reinforcing or joint strategies; (3) identify and address needs by leveraging resources; (4) agree on roles and responsibilities; (5) establish means of operating across agency boundaries; (6) develop mechanisms to monitor, evaluate, and report on results; (7) reinforce agency accountability for collaborative efforts through agency plans and reports; and (8) reinforce individual accountability for collaborative efforts through performance management systems.²² The following are some of the interagency coordination efforts the Coast Guard has been or is part of and the key practices that they address:

- NSPD-66/HSPD-25 established the policy of the United States with respect to the Arctic region and specified implementation actions to be taken by federal agencies. The adoption of NSPD-66/HSPD-25 addresses two key practices—defining and articulating a common outcome and delineating agency roles and responsibilities. Specifically, the policy clarifies governmentwide policy priorities in the Arctic and tasks specific heads of departments with the responsibility to coordinate implementation.
- Another interagency coordination effort involving Coast Guard participation is the Interagency Policy Committee on the Arctic. The

²¹ The operation and maintenance of Coast Guard icebreakers was funded through NSF's budget in fiscal years 2006 through 2009, which, according to Coast Guard officials, presented challenges to maintaining the polar icebreaker fleet and ensuring Coast Guard crews are properly trained. Fiscal year 2010 appropriations (Pub. L. No. 111-117, 123 Stat. 30304, 3145 (2009)), however, directed the transfer of the \$54 million icebreaker budget from NSF to the Coast Guard and a new agreement governing the relationship between the Coast Guard and NSF temporarily supersedes their 2005 agreement. In addition, the DHS Office of Inspector General is currently assessing the Coast Guard's need for heavy-duty icebreakers to accomplish its missions.

²² See GAO, *Results-oriented Government: Practices That Can Help Enhance and Sustain Collaboration Among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).

White House's National Security Staff and Council on Environmental Quality co-chair this committee, which was created in March 2010. The committee is an interagency body established to coordinate governmentwide implementation of NSPD-66/HSPD-25. According to Coast Guard and State Department officials, one of the committee's first tasks was to compile information from all relevant agencies on their activities in support of NSPD-66/HSPD-25; the compilation is considered an active document that National Security Staff will use to track progress and identify policy implementation gaps. Coast Guard officials reported that this committee is a great forum for federal agencies to identify opportunities for collaboration. This interagency coordination effort addresses aspects of key practices we have previously identified including: identifying and addressing needs by leveraging resources; developing mechanisms to monitor, evaluate, and report on results; and reinforcing agency accountability for collaborative efforts through agency plans and reports.

- The establishment of mutually reinforcing or joint strategies and plans between the Coast Guard and the U.S. Navy demonstrates another Coast Guard interagency coordination effort. For example, in October 2007 the Coast Guard, U.S. Navy, and U.S. Marine Corps published a unified maritime strategy which stressed the importance of an unprecedented level of integration among maritime forces and enhanced cooperation in light of the changes taking place in the Arctic, among other challenges.²³ In addition, the Coast Guard and U.S. Navy have worked collaboratively to develop their respective Arctic roadmaps—the Navy published its roadmap in November 2009 and, as of July 2010, Coast Guard officials reported that their Arctic Roadmap was in final draft form and undergoing senior level agency review. The Navy's Arctic roadmap lays out specific action items, objectives, and desired effects for the Arctic region from fiscal years 2010 through 2014 and identifies areas for collaboration with the Coast Guard throughout. Coast Guard officials report that their agency's Arctic Roadmap is specifically responsive to the directives in NSPD-66—laying out the six principle objectives of NSPD-66 and drilling down to a list of specific action items for various Coast Guard offices.

²³ Coast Guard, U.S. Navy, and U.S. Marine Corps, *A Cooperative Strategy for 21st Century Seapower* (October 2007). Additionally, the implementation document for this strategy—*Naval Operations Strategy 2010: Implementing the Maritime Strategy*—was released in April 2010 and discusses strategy and resource needs in the Arctic.

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- Finally, the Coast Guard and the Navy have made efforts to establish compatible policies, procedures, and other means to operate across boundaries—another key practice we have identified to enhance interagency collaboration. The Coast Guard and the Navy have numerous agreements and policies governing interagency collaboration including the National Strategy for Maritime Security and its supporting plans and the National Defense Strategy.²⁴ The two agencies also have a long-standing memorandum of agreement regarding the use of the Nation’s icebreakers—the Coast Guard operates the nation’s icebreakers and uses them, when needed, to support the Navy.²⁵ The Navy’s Arctic Roadmap identifies further opportunities to improve collaboration with the Coast Guard. For example, it identifies the need to revisit existing agreements, or form new ones, concerning interoperability and collaborative efforts in the Arctic including operations, training, and common investments to achieve economies of scale. The Navy’s Arctic Roadmap also describes plans to investigate command, control, communications, computers, intelligence, surveillance, and reconnaissance interoperability with the Coast Guard in anticipation of increased joint operations in the region.

The Coast Guard is also involved in numerous other interagency coordination efforts related to the Arctic. See appendix IV for descriptions of other select interagency coordination efforts and how they address key practices.

²⁴ For more on the National Strategy for Maritime Security see GAO, *Maritime Security: National Strategy and Supporting Plans Were Generally Well-Developed and Are Being Implemented*, [GAO-08-672](#) (Washington, D.C.: June 20, 2008).

²⁵ The 1965 U.S. Navy-U.S. Treasury Memorandum of Agreement was executed to permit consolidation of the icebreaker fleet under one agency. That rationale was reinforced by a 1982 Roles and Missions Study which stated that polar icebreakers should be centrally managed by one agency and that the Coast Guard was the appropriate one due to the multimission nature of polar ice operations. This memorandum of agreement was updated in 2008. The signatories were DOD and DHS and the agreement included an update on responsibilities for coastal security.

The Coast Guard Coordinates with State and Local Governments on Operational Issues

The Coast Guard coordinates with state and local governments on issues related to Arctic operations.²⁶ For example, Coast Guard officials report regular communication with Alaska state agencies on common missions such as with the Department of Fish and Game on fisheries enforcement; the Department of Natural Resources on regulatory inspections of oil and gas vessels, coastal management, and boating safety; and the Department of Environmental Conservation on oil spill prevention and response. Additionally, state officials report that regularly scheduled meetings such as the Coast Guard's bimonthly teleconferences with Alaska Department of Fish and Game and the Alaska Wildlife Troopers serve as an opportunity to exchange information and assist each other with logistical and operational challenges. Local government officials we met with also reported having open lines of communication with the Coast Guard and noted that this is particularly important to ensure they are included in discussions that affect their region. For example, North Slope Borough officials and the Mayor of Nome reported that the Coast Guard coordinated closely with them when preparing to conduct summer operations in the Arctic and attributed the Coast Guard's success in engaging the Arctic communities to this close coordination in advance of their operations. Appendix III provides additional examples of coordination between the Coast Guard and state and local governments.

The Coast Guard Engages Alaska Native Interest Groups to Improve the Agency's Cultural and Operational Awareness

Coast Guard officials report that coordination with Alaska Native governments and interest groups is of utmost importance to gain on-the-ground information and to enhance the agency's cultural awareness.²⁷ The Coast Guard Commandant emphasized in August 2009 that the dialogue, collaboration, and lessons learned from Alaska Native interest groups are essential for safe operations in the Arctic. As such, the Coast Guard has made outreach to Alaska Native leaders a key facet of its recent Arctic activities including summer operations on the North Slope and a summer 2009 visit from several high ranking White House and agency officials.

²⁶ Local government officials we interviewed were either borough or city government officials. Alaska's constitution and state laws allow for several types of regional and local government units—such as boroughs, which are units of government that are similar to the counties found in many other states. About one-third of Alaska is made up of 16 organized boroughs. The remaining two-thirds of the state is sparsely populated land that is considered a single “unorganized borough.”

²⁷ For the purposes of this report, Alaska Native interest groups include Alaska Native Tribal councils, regional and village corporations, as well as other Alaska Native organizations.

Both of the Alaska Native interest groups we interviewed had positive remarks about the Coast Guard's recent approach to relationship building with the Alaska Native community. For example, one representative of an Alaska Native interest group on the North Slope stated that the Coast Guard is a model agency in how it has interacted with the Alaska Native community and that the impact of such efforts was greater Coast Guard access to community knowledge, resources, and support. Another Alaska Native official representing eight villages on the North Slope of Alaska stated that he was very impressed with the Coast Guard's approach to the Alaska Native communities. Appendix III provides examples of operational coordination between the Coast Guard and Alaska Native interest groups.

To sustain these outreach efforts with Alaska Natives, the Coast Guard recently took steps to reinstate a tribal liaison position in District 17. District officials reported that since January 2009, they have had one half-time tribal liaison billet dedicated to coordination and outreach with the Alaska Native community. In July 2009, District 17 officials submitted a request to the Commandant seeking a full-time tribal liaison position. However, Coast Guard officials told us that the request was not acted upon and, in spring 2010, authority over this position was transferred to Coast Guard Headquarters and the position was modified to no longer include tribal liaison duties. In July 2010, after we discussed this issue with Coast Guard officials, Pacific Area and the Commandant announced the creation of a full-time tribal liaison billet to engage Alaska Native communities.

The Coast Guard Uses Formal and Informal Mechanisms to Coordinate with the Private Sector in the Arctic

The Coast Guard uses formal and informal mechanisms to coordinate with a variety of private sector stakeholders in the Arctic including those with interests in Arctic resource extraction, commercial fishing, tourism, and shipping. In terms of formal relationships, the Coast Guard has a contract with the Marine Exchange of Alaska, a nonprofit vendor of real-time Automatic Information System (AIS) data, to provide the Coast Guard with

data on vessel traffic for certain parts of Alaska.²⁸ In another example, Coast Guard officials and oil and gas representatives are advisory board members of the Prince William Sound Oil Spill Recovery Institute, which supports projects designed to understand and respond to the effects of oil spills in the Arctic region.

The Coast Guard also coordinates with private interests through informal mechanisms. For example, Shell Oil Company officials stated that they have briefed Sector Anchorage and District 17 officials on details of their oil exploration activities including time lines, location of industry vessels, and industry capabilities. Similarly, officials representing the Alaska cruise industry stated that they have met with Sector Anchorage officials as well as senior leadership from District 17 to discuss cruise ship routes and logistics. In addition to the for-profit private sector, the Coast Guard also has informal coordination with various nonprofit entities with Arctic interests. For example, officials from an environmental nonprofit organization stated that they interact with Coast Guard officials at public forums and through the North Pacific Fisheries Management Council. In addition, officials from the Marine Conservation Alliance—an organization established by the Alaska seafood industry to, among other things, promote sustainable fishing—reported that the Coast Guard is doing a good job of cultivating a positive relationship with the Russian Border Guard, which is particularly important to ensure enforcement of the U.S. decision to close U.S. Arctic waters to commercial fishing. Appendix III provides further examples of coordination between the Coast Guard and the private sector on Arctic operations.

²⁸ AIS equipment transmits information such as the name of the vessel, its position, speed, course, and destination to receivers within range of its broadcast, allowing AIS-equipped vessels to be tracked when they are operating in coastal areas, inland waterways, and ports. Receivers may be installed on other vessels, land stations, or other locations. Coast Guard personnel can monitor screens transmitting information on the tracked vessels. The Marine Exchange of Alaska operates a network of AIS receivers throughout Alaska to capture vessel transmissions (name, position, course, speed, etc) for the purposes of tracking the vessels operating in and around Alaska's waterways, including the Arctic region.

Stakeholders Reported Having Limited Information about the Coast Guard's Arctic Planning Efforts and More Communication about Agency Planning Efforts Would Be Beneficial

The state and local Arctic stakeholders we met with were generally positive about Coast Guard's coordination on day-to-day operations but 9 out of 15 of these stakeholders also reported that they lack information on both the Coast Guard's ongoing planning efforts and future approach in the Arctic. For example, a group of state and local officials told us that they thought the Coast Guard had already developed its Arctic plans but had not yet shared this information with them. One local government official who has worked closely with the Coast Guard stated that the High Latitude Study interviews and the agency's recent community outreach in the Arctic have raised public expectations that the Coast Guard will be establishing a year-round presence in the region, but this official reported not knowing whether this expectation would be realized or not. A State of Alaska official reported that his office and others may be willing to invest in infrastructure that could benefit the Coast Guard but this would be difficult to do if they did not know of the agency's plans and time frames for action. In addition, officials at an environmental nonprofit organization we met with were concerned that the Coast Guard did not have a formal process in place such as that used for proposed regulations that would make information available to the public as well as offer an opportunity for public input to be provided to the agency regarding its Arctic plans. Finally, an Alaska Native North Slope resident and environmental policy advisor we met with reported that local communities want more information on what the Coast Guard is doing or planning to do in the Arctic.

Our prior work on organizational transformations identified an effective external communication strategy as essential to successful transformation in federal agencies—changes such as those the Coast Guard will likely experience with its potential operational growth in a new and large geographic area.²⁹ We have previously reported that establishing a communication strategy should be a top priority for agencies undergoing a transformation and is central to creating shared expectations, reporting on progress, and forming the partnerships needed to develop and implement an organization's strategies. We have previously reported that communication is most effective when done early and often and this helps to build an understanding of the purpose of planned changes and builds trust among stakeholders. We have also reported that establishing a

²⁹ GAO, *Highlights of a GAO Forum: Mergers and Transformation: Lessons Learned for a Department of Homeland Security and Other Federal Agencies*, [GAO-03-293SP](#) (Washington, D.C.: Nov. 14, 2002).

communication strategy is important in the public sector, where policy making and program management call for transparency regarding the goals and outcomes to be achieved and the processes to be used in achieving them. In addition to our prior work on organizational change, *Standards for Internal Control in the Federal Government* state that management should ensure there are adequate means of communicating with, and obtaining information from, external stakeholders that may have a significant impact on the agency achieving its goals.³⁰

Coast Guard headquarters officials told us that they have been focused on communication with congressional and federal stakeholders and, as of July 2010, did not have a communication strategy in place for communicating to state and local stakeholders in Alaska on the progress, time frames, or results of the agency's Arctic planning efforts. Agency officials told us they would likely develop such a strategy when the ongoing High Latitude Study is completed and the administration determines a course of action. However, it could be months or years before a course of action is determined. Developing a communication strategy to report on *results* is important; however, stakeholders are also interested in the process and progress of the agency's planning efforts. Limited Coast Guard communication on the process and progress of its Arctic planning efforts has resulted in some state and local stakeholders reporting that they lack information they believe would be useful to facilitate their own participation in the process and allow for their planning efforts. In addition, the Coast Guard could be missing an opportunity to create shared expectations and report on its progress with key partners. While we recognize that the Coast Guard and the administration are still developing their Arctic strategy, communicating about the planning process and interim steps is key to creating transparency and providing a context for agency plans.

³⁰ [GAO/AIMD-00-21.3.1.](#)

The Coast Guard Is Taking Action to Identify Future Arctic Requirements While Routine Operations Provide Other Valuable Information

High Latitude Study Is the Centerpiece of the Coast Guard's Efforts to Identify Arctic Requirements

The Coast Guard has multiple efforts underway to better understand the agency's future requirements and gaps in both the Arctic and Antarctic with its primary effort being the High Latitude Study, an effort undertaken in response to congressional direction.³¹ In August 2009, the Coast Guard contracted out the development of the High Latitude Study with the goal of producing three related mission analyses related to (1) Polar icebreaking needs, (2) all 11 Coast Guard missions in the Arctic region, and (3) all 11 Coast Guard missions in the Antarctic region.³² In carrying out the study, contractors have conducted literature reviews, held workshops to obtain Coast Guard stakeholder input, and conducted site

³¹ The explanatory statement accompanying the DHS fiscal year 2008 appropriations directed the Coast Guard to submit a report that assesses the Coast Guard's Arctic mission capability and an analysis of the effect a changing environment may have on the current and projected polar operations, including any additional resources in the form of personnel, equipment, and vessels. In response, the Coast Guard produced a December 2008 "Report to Congress: U.S. Coast Guard Polar Operations." This report provided an overview of the Arctic and Antarctic operating environments and Coast Guard's current capabilities, and described a proposed High Latitude Study to fully determine the scope of mission requirements. Then, in the president's fiscal year 2009 budget request, the Coast Guard requested and a House report accompanying the DHS fiscal year 2009 appropriations directed \$200,000 for this study. Most recently, the conference report accompanying the DHS fiscal year 2010 appropriations directed the agency to continue its analysis of national mission needs in the high latitude regions to inform national polar policy.

³² A mission analysis report is the first step in a major system acquisition continuum. According to the Coast Guard's Major Systems Acquisition Manual, a mission analysis report is a collection, cross analysis, and documentation of numerous feeder studies and analyses that look across a number of different mission areas. The mission analysis report is not intended to be an asset-oriented analysis. The mission analysis report has two parts—part 1 lays out the assessment of a deficiency in functional capability which will prevent the Coast Guard from adequately conducting missions now or in the future, and part 2 provides justification and preliminary options for satisfying mission capability gaps.

visits and interviews with Coast Guard units in Alaska as well as with other stakeholders, including private sector, federal, state, local, Alaska Native, and international interest groups. Coast Guard officials estimate the study's cost at \$1.7 million and that all three volumes will be ready for Coast Guard internal review in summer 2010; however, they won't be released publicly until a later date.

The Arctic mission analysis piece of the High Latitude Study is expected to include³³

- an analysis of the functional requirements to carry out the Coast Guard's existing missions in the Arctic,
- an analysis of how the Coast Guard might close any operational gaps,
- solutions for a range of future demand scenarios such as a mass search and rescue incident or an Arctic oil spill (including looking at partnerships and opportunities to leverage resources), and
- a rough order of magnitude cost estimate.

According to Coast Guard officials, the High Latitude Study is not expected to detail specific recommended solutions or assets, but rather identify the types of capabilities needed in the Arctic. In addition, while not Arctic-specific, DHS and the Coast Guard have begun a comprehensive Fleet Mix Analysis—an analysis of the capabilities, number, and mix of assets it needs to fulfill the agency's missions. According to Coast Guard officials, this analysis is due to be completed in December 2010 and is expected to include more specific fleet requirements for surface

³³ The definition of the Arctic used in the High Latitude Study is the federal definition established by the Arctic Research and Policy Act of 1984.

operations in the Bering Sea region of the Arctic but not above the Arctic Circle.³⁴

The Coast Guard's Temporary Arctic Operations Test Assets, Build Relationships with Local Communities, and Inform Operational Requirements

Another action the Coast Guard has taken specifically to inform its Arctic requirements has been the establishment of temporary, seasonal operating locations in the Arctic. These efforts, conducted during the summers of 2008 and 2009, were focused on improving the agency's knowledge of the Arctic region and identifying requirements needed to carry out its missions there. The specific objectives of these temporary operating locations have been to improve Arctic domain awareness, test communications, test the agency's ability to respond to incidents, and engage with the local Alaska Native communities. These Arctic deployments have been short—in Barrow for 2 weeks in the summer of 2008 and in Barrow, Nome, and Prudhoe Bay for about 6 weeks in 2009—and have not involved the construction of permanent infrastructure.

The Coast Guard used these efforts to identify performance requirements and obstacles associated with the deployment of small boats, aircraft, and support staff above the Arctic Circle. According to Coast Guard officials, lessons learned from these activities are captured in after-action reports that are being used to inform future Arctic requirement planning efforts. For example, in the summer of 2008 the Coast Guard experimented with small response boats and MH-65 helicopters in Barrow, Alaska and the agency's after-action report states that the Coast Guard learned about the lack of infrastructure, such as hangar space, in Barrow and grappled with the lack of reliable navigation charts in the region.³⁵ These challenges to Arctic operations are described later in this report. As part of the summer

³⁴ The Coast Guard expects the fleet mix analysis to assist in determining capability-capacity-performance sensitivities and serve as one tool, among many, in making future capability requirements determinations, including future fleet mix decisions. According to Coast Guard officials, the agency plans to update this fleet mix analysis every 4 years and use it as a basis to update the numbers and types of assets needed for the Deepwater program. The Deepwater Program—the largest acquisition program in the Coast Guard's history—began in the late 1990s as an effort to recapitalize the Coast Guard's operational fleet. The program now includes projects to build or modernize five classes each of ships and aircraft, and procurement of other capabilities.

³⁵ Small response boats are 25-foot long and capable of fast and high-speed maneuvering tactics. The MH-65 is the Coast Guard's main helicopter and used in search and rescue, drug interdiction, and homeland security missions. According to the Coast Guard, the MH-65 is capable of operating in the polar environment but requires a heated hangar for storage and maintenance between flights. It must also avoid operating in conditions of visible moisture that will cause ice to form on the aircraft and avoid temperatures below -13 degrees Fahrenheit. The Arctic limitations of these assets are discussed later in this report.

2009 deployment, the Coast Guard carried out an “Arctic Crossroads” program—including, among other things, boating safety awareness programs for children, veterinary services, and outreach to Alaska Native communities in the Arctic. According to the Coast Guard, these outreach activities highlighted the importance of good relations with village leadership and tribal elders for future Arctic operations.

The Coast Guard is planning additional Arctic operating location activities for the summer of 2010. According to Coast Guard officials, the 2010 activities will include daily small boat operations in Kotzebue; medical, veterinary, and water safety outreach to 10 remote communities; and HC-130 maritime boundary line patrols.³⁶ In addition, the Coast Guard icebreaker Healy will work closely with a Canadian Coast Guard icebreaker on a science mission in August and September. The Coast Guard had also planned to have the Polar Sea icebreaker retrieve science buoys and deliver medical personnel to four villages, but the ship’s scheduled 2010 Arctic patrol has been cancelled due to engine problems. In addition, Coast Guard District 17’s planned use of its buoy tender—the Hickory—for summer 2010 Arctic operations has been cancelled because another District 17 buoy tender—the Sycamore—was deployed to the Gulf of Mexico to assist with Deepwater Horizon oil spill response efforts and the Hickory is needed to cover their Aids to Navigation responsibilities.

The Coast Guard’s Arctic Overflights Also Test Capabilities, Increase Maritime Domain Awareness, and Inform Requirements

Another key Coast Guard effort specifically focused on gaining Arctic information has been the Coast Guard’s Arctic overflights, which were initiated to increase the agency’s maritime domain awareness, test personnel and equipment capabilities in the Arctic, and inform the agency’s Arctic requirements, among other things. The Coast Guard initiated seasonal (March-November) biweekly Arctic domain awareness flights in October 2007. Coast Guard officials reported that these flights have resulted in better situational awareness—the Coast Guard is gaining biweekly observations of Arctic ice conditions and vessel traffic—and operational insight that is being used to inform the agency’s future Arctic

³⁶ The HC-130 Hercules is a long-range surveillance and transport, fixed-wing aircraft that is used to perform a wide variety of missions.

requirements.³⁷ For example, the Coast Guard's after-action report from a May 2010 overflight along the northwestern coast of Alaska lists four objectives: maritime security and national defense patrol, monitor impact from coastal erosion, familiarize and train pilot and crew above the Arctic Circle, and collect scientific data for NOAA.³⁸ The after-action report lists the vessels sighted and includes descriptions of the weather and ice coverage—information that improves the Coast Guard's situational awareness and may be helpful in determining the agency's future Arctic requirements. An October 2007 overflight after-action report notes the lack of communications connectivity on the North Slope and lack of support infrastructure for the HC-130 in Barrow. (These challenges are elaborated later in this report.) According to the Coast Guard, the information gathered from Arctic overflights informs the agency's future Arctic requirements by, for example, improving pilot familiarity with the region, providing information on the limitations of aircraft, and providing marine mammal observation data. Figure 4 shows the view from a Coast Guard flight over Kivalina, Alaska in May 2009.

³⁷ While Arctic domain awareness flights contribute to the Coast Guard's awareness of vessel traffic in the Arctic, the agency is also in the process of acquiring more AIS real-time vessel traffic data in the Arctic. According to officials at the Marine Exchange of Alaska, a nonprofit which sells AIS data to the Coast Guard, AIS may provide cheaper and more comprehensive vessel tracking data than Arctic domain awareness flights. However, Coast Guard officials told us that AIS is not a panacea as (1) only vessels weighing over 300 tons are required to have AIS on board and (2) vessels that do not want to be detected are unlikely to comply with the AIS requirement or may spoof another ship's AIS signal. For more on this see GAO, *Maritime Security: Vessel Tracking Systems Provide Key Information, but the Need for Duplicate Data Should Be Reviewed*, [GAO-09-337](#) (Washington, D.C.: Mar. 17, 2009).

³⁸ The Coast Guard has partnered with NOAA to track methane and carbon dioxide emissions over Alaska using instruments on Coast Guard's HC-130 aircraft during Arctic domain awareness flights.

Figure 4: A Coast Guard HC-130 Aircraft on an Arctic Domain Awareness Flight in May 2009 above Kivalina, Alaska



Source: Coast Guard.

The Coast Guard's Routine Arctic Operations Also Inform Requirements

In addition to the specific Coast Guard actions taken to inform its Arctic requirements, the agency is also gaining valuable knowledge about the Arctic from conducting its routine mission operations in the region. Through routine mission operations—especially those related to icebreaking, search and rescue, marine environmental protection, and Aids to Navigation—the Coast Guard has been able to collect useful information on the capability of its existing assets, strategies for overcoming logistical challenges presented by long-distance responses to incidents, and the resources needed to respond to an oil spill in a remote and cold location, among other things. According to the Coast Guard, these routine mission activities have provided further insight into the agency's future Arctic requirements. For more information on these actions, see appendix V.

The Coast Guard's Preliminary Efforts to Determine Future Arctic Requirements Generally Align with Key Practices We Have Identified for Defining Agency Missions

Our prior work on the key steps and critical practices to implement the Government Performance and Results Act of 1993³⁹ highlighted the importance of three key practices in an agency's effort to define its mission and desired outcomes, all of which are relevant to the Coast Guard's ongoing planning efforts: (1) involve stakeholders; (2) assess environment; and (3) align activities, core processes, and resources.⁴⁰ We reported that successful organizations we studied based their strategic planning, to a large extent, on the interests and expectations of their stakeholders. Stakeholder involvement is important to help agencies ensure that their efforts and resources are targeted at the highest priorities. Just as important, involving stakeholders in strategic planning efforts can help create a basic understanding among the stakeholders of the competing demands that confront most agencies, the limited resources available to them, and how those demands and resources require careful and continuous balancing. We further reported on the importance of managers assessing the environment—both inside and outside their organizations—in order to anticipate future challenges and to make adjustments so that potential problems do not become crises. The third critical practice—align activities, core processes, and resources—will be important once the Coast Guard determines its mission and desired outcomes in the Arctic.

Though the Coast Guard is still early in its Arctic planning process, the agency's preliminary efforts address elements of each of these key practices to define agency missions and desired outcomes. Specifically, the Coast Guard has involved stakeholders in its planning efforts by conducting over 50 interviews with a wide range of stakeholders as part of the High Latitude Study and consulting with local leaders and Alaska Native elders as part of its temporary operations on the North Slope in the summers of 2008 and 2009. The Coast Guard has assessed its environment by reviewing the agreements and policies, domestic and international, that impact the agency's requirements in the Arctic, taking stock of other nations' activities and interests in the region, and analyzing the "drivers" or potential sources of change in the Arctic. In addition, the agency's Arctic overflights and temporary operations improve the agency's Arctic domain

³⁹ The Government Performance and Results Act of 1993 is the primary legislative framework through which agencies are required to set strategic goals, measure performance, and report on the degree to which goals were met.

⁴⁰ See GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

awareness. Finally, the High Latitude Study addresses the third critical practice of aligning activities, core processes, and resources by beginning to identify the potential activities and resources needed to support the Coast Guard's Arctic missions and goals.

The Coast Guard Faces Numerous Challenges to Current and Future Arctic Operations

The Coast Guard Has Limited Maritime Domain Awareness in the Arctic, but Is Working to Acquire Additional Data

Coast Guard officials report that improved maritime domain awareness is critical to the agency's operations in the region but the agency faces several challenges to addressing this. According to the Coast Guard, maritime domain awareness is an effort to achieve an understanding of anything in the maritime environment that can affect the security, safety, economy, or environment of the United States.⁴¹ Coast Guard documents state that Arctic domain awareness—maritime domain awareness in the Arctic—is critical to understanding the risks to the maritime community and infrastructure, the Arctic environment, and Alaska Native culture and subsistence lifestyle. In addition, in 2008, the Coast Guard reported to Congress that Arctic domain awareness will be critical to effective engagement in the Arctic as activity increases.⁴² At the beginning of the agency's 2008 summer deployment in the Arctic, District 17 officials reported not having the Arctic domain awareness to fully understand the context or the risks of operating in or monitoring the Arctic and explained that the summer operations were intended to address this. According to senior Coast Guard officials, Coast Guard after-action reports of summer Arctic operations, and other federal partners, challenges exist for the Coast Guard in achieving Arctic domain awareness. These challenges

⁴¹ The process of achieving maritime domain awareness includes: (1) collection of information, (2) fusion of information from different sources, (3) analysis through the evaluation and interpretation of information, and (4) dissemination of information to decision makers, with the goal of identifying risks and threats before they turn into catastrophic events.

⁴² See *Report to Congress: U.S. Coast Guard Polar Operations* (December 2008).

include (1) inadequate Arctic Ocean and weather data, (2) lack of communication infrastructure, (3) limited intelligence information, and (4) lack of a physical presence in the Arctic. For example:

Inadequate Arctic Ocean and Weather Information: NOAA officials reported a lack of accurate data for Arctic navigation including, among other things, tides, nautical charts, water levels, currents, shoreline, sea ice, and meteorological information. This lack of information can have an impact on the ability of the Coast Guard to conduct routine and emergency missions. For example, during its summer Arctic deployments the Coast Guard reported that smaller pieces of sea ice are often missed by current technology and, while inconsequential for icebreakers, this sea ice represents a significant hazard for the remainder of the Coast Guard's portfolio of boats.

Lack of Communication Infrastructure: The Coast Guard reported communication problems during its summer operations due to limited network infrastructure. Coast Guard officials noted that high-frequency radio communication is unreliable for low-flying aircraft in the U.S. Arctic and is ineffective at extreme latitudes. For example, Coast Guard HC-130 aircraft and icebreakers deployed to the Arctic may be unable to communicate with one another on high-frequency radio despite being in relatively close proximity unless special equipment is on board.⁴³ For the 2009 deployment, the Coast Guard reported that reliable communications continue to be the primary concern when conducting forward operations. These communication issues present safety concerns for Coast Guard Arctic operations. To help improve communications, the Coast Guard is planning to replace antiquated communications systems nationwide with an advanced command, control, and communications system called Rescue 21.⁴⁴ However, because of the unique operating and support requirements of the Alaska region, Coast Guard will be implementing a modified, commercially-based solution in Alaska rather than the current Rescue 21 system.

⁴³ A Coast Guard official explained that this is due to magnetic interference at high latitudes and noted that satellite communications using UHF bandwidth or line-of-sight radio frequencies (VHF-FM/AM) are not similarly affected.

⁴⁴ Rescue 21 is designed to improve the Coast Guard's ability to execute all missions in the coastal zone, and, according to the Coast Guard, is essential to its search and rescue mission. The Coast Guard is deploying Rescue 21 to locations across the United States. See GAO, *Department of Homeland Security: Assessments of Selected Complex Acquisitions*, [GAO-10-588SP](#) (Washington, D.C.: June 30, 2010).

Limited Intelligence Information: Senior Coast Guard officials reported that while Arctic intelligence gathering is not an immediate concern, the agency does need to develop greater capacity in this area as Arctic activity increases. Coast Guard District 17 officials reported that current sources of Arctic intelligence include biweekly Arctic domain awareness overflights, temporary Arctic operations, satellite and AIS information, Joint Terrorism Task Force meetings, and international information sharing. District 17 officials also reported that they search the internet and open sources for information on Arctic vessel traffic and adventure cruises.⁴⁵ To obtain more information on Arctic vessel traffic, District 17 Coast Guard officials are pursuing the purchase of additional real-time AIS data for the Arctic, but they reported that funding limitations remain a concern. Also, Coast Guard's report to Congress notes that these intelligence limitations diminish the Coast Guard's ability to successfully monitor, assess, and maintain a predictive advantage and operational awareness of Arctic activities.

Lack of an Arctic Presence: The Coast Guard has a very limited physical presence in the Arctic. Most of the Coast Guard's on-the-ground activity in the Arctic has taken place during the agency's brief summer deployments in the region. The Coast Guard's physical presence also consists of biweekly Arctic overflights, patrols by icebreakers, and District 17's buoy tender, when those assets are available. In recent years, however, the Coast Guard's icebreakers have had mechanical problems which have limited their usage in the Arctic and the buoy tender has currently been redeployed. Coast Guard District 17 officials noted that this lack of overall presence affects the Coast Guard's ability to project U.S. sovereignty, gather intelligence, and respond to incidents.

Senior District 17 officials stated that they had taken actions to try to increase their Arctic awareness. For example, District 17 has stationed HC-130 airplanes in Nome and Kotzebue during the summer months to provide easier access to the maritime boundary with Russia and to monitor foreign commercial fishing incursions into U.S. waters. Additionally, the Coast Guard will continue its summer deployments in 2010 and pursue a contract to purchase data for 10 additional AIS sites from the Marine Exchange of Alaska. Three of these sites are expected to

⁴⁵ The Alaska Joint Terrorism Task Force is comprised of the Federal Bureau of Investigation and 14 core agencies, which conduct counterterrorism investigations and intelligence collection, analysis, and dissemination throughout Alaska; prepare for special events management; and conduct crisis management.

provide additional Arctic domain awareness on transiting vessels. These are small steps towards understanding the Arctic environment and without additional Arctic infrastructure, assets, and data, limited Arctic domain awareness will remain a challenge.

Coast Guard Assets and Infrastructure for Arctic Missions Are Limited and Not Suitable for the Arctic Environment

District 17 officials reported that they do not have the assets to effectively conduct their missions in the Arctic. In anticipation of a growing demand for a Coast Guard presence in the Arctic, District 17 has used its temporary Arctic operations as an opportunity to test the adequacy of its assets (boats, helicopters, airplanes) in Arctic conditions. Coast Guard after-action reports and officials both reported several asset challenges: (1) an inadequate portfolio of small boats for Arctic operations, (2) an environmental impact on helicopters and airplanes, and (3) a lack of cutter resources for Arctic patrols.

Inadequate Portfolio of Small Boats for Arctic Operations: The combination of ice floes, steeper waves, and shallow, silt-filled water presents an extremely hazardous operating environment for small boats in the Arctic. District 17 officials reported that these conditions render the agency's current portfolio of small boats ineffective for safe operations. Coast Guard officials report that it will be difficult for the agency to carry out its statutory missions in the Arctic if another small boat option is not identified. Figure 5 shows a Coast Guard response boat in Arctic waters off of Barrow, Alaska.

Figure 5: A Response Boat in Arctic Waters Off of Barrow, Alaska



Source: Coast Guard.

Environmental Impact on Helicopters and Airplanes: The unique operating conditions in the Arctic—freezing temperatures, snow, and ice—make helicopter and airplane missions tenuous. For example, during the 2008 summer deployment, the Coast Guard reported that the vast distances, icing conditions, and scarcity of aviation fuel on the North Slope rendered the Coast Guard’s MH-65 helicopter ineffective for North Slope operations. Additionally, during the 2009 summer deployment, the Coast Guard reported that MH-60 helicopters would need to operate in tandem to provide backup self-rescue resources in remote areas.⁴⁶ The Coast Guard reported that while the HC-130 Hercules airplane is capable of operating in harsh conditions, major modifications (e.g., aircraft structures, hydraulic and electrical systems, landing gear skis, fuel with a lower freezing point) would be required to operate in Arctic conditions throughout the entire year.

⁴⁶ The MH-60 is the Coast Guard’s medium-range recovery helicopter.

Lack of Cutter Resources for Arctic Patrols: Senior Coast Guard officials reported that in fiscal year 2010 the agency has less than two major medium endurance or high endurance cutters at a time available to cover its statutory missions in all Alaskan waters—an area of responsibility equal to the size of the continental United States—and that this resource level is inadequate to sustain the Coast Guard’s current requirements in Alaska, let alone expanded Arctic operations.⁴⁷ Coast Guard officials noted that this low level of cutter availability limits the agency to patrols in the Bering Sea. Senior Coast Guard officials reported that District 17 has seen a year-to-year reduction in the number of large cutters available for district operations—from the equivalent of 3.0 cutters on patrol at the same time in Alaska in 2005 to 2.0 in 2006, to less than 2.0 cutters in 2009, to about one cutter programmed to be on patrol at all times in Alaska beginning in 2011.⁴⁸ Senior Coast Guard officials also reported that additional cutter time will be needed to provide adequate resources for the Coast Guard’s Arctic missions, especially since the Arctic region is such a remote and challenging operating environment. In addition, some Coast Guard officials are concerned that the planned replacement of 12 high-endurance cutters with 8 new National Security Cutters may exacerbate this challenge, though others noted that the proposed Offshore Patrol Cutters may make up some of the difference. However, as of July 2010, DHS and the Coast Guard were still developing

⁴⁷ The 378-foot High Endurance Cutter class are the largest cutters ever built for the Coast Guard. Equipped with a helicopter flight deck, retractable hangar, and the facilities to support helicopter deployment, the High Endurance Cutter is versatile and capable of performing a variety of missions, and operates throughout the world’s oceans. Medium Endurance Cutters are helicopter-capable medium-range, medium-endurance platforms.

⁴⁸ Under Coast Guard scheduling policy, a 1.0 allocation equates to a full year of scheduled cutter days. A 2.0 allocation means two cutters are always scheduled to be on patrol. Cutters deploy from Kodiak, Ketchikan, Seattle, San Francisco, San Diego, and Hawaii. Lost cutter days occur when cutters are unable to deploy due to engineering difficulties, maintenance that exceeded planned days, or unexpected extensions for the cutter(s) on patrol, among other things.

The Coast Guard Lacks the Infrastructure to Maintain a Consistent Presence in the Arctic

the requirements for the Offshore Patrol Cutter and a deployment date has yet to be determined.⁴⁹

Coast Guard officials acknowledge that many of the agency's assets are not suitable for the Arctic environment and said they are beginning to develop potential solutions. For example, in March 2010, Senior District 17 officials sent a memo to Pacific Area Command and Coast Guard Headquarters requesting assistance in researching and identifying a suitable small boat platform for Arctic operations. The memo listed a set of requirements and capabilities including, among other things, a jet-driven engine, ability to operate in slush ice and 8-foot seas, and ability to be transported by an HC-130 aircraft. District 17 officials reported in June 2010 that the agency has identified a 28-foot boat that may meet some, but not all, of the requested parameters for an Arctic boat. District 17 officials also reported that they plan to have the prototype of this boat tested during the 2010 summer deployment in Kotzebue. However, District 17 officials stated that this particular boat is not HC-130 compatible, and thus is not acceptable for their Arctic needs.

The Coast Guard lacks the infrastructure to maintain a consistent presence in the Arctic. In its 2008 report to Congress, the Coast Guard noted that as Arctic activities increase the "United States will need a maritime surface and air presence in the Arctic sufficient to support appropriate prevention and response regimes as well as diplomatic objectives." Especially important to achieving this presence is shore-based infrastructure which is essential for Arctic operations including, among other things, logistical support for air and surface operations, coordination with stakeholders, and improved response times. However, the Coast Guard does not have any permanent infrastructure in the Arctic.⁵⁰ For

⁴⁹ The National Security Cutter is the largest and most technically advanced class of cutter in the Coast Guard, with capabilities for maritime homeland security, law enforcement, and national defense missions. As we previously reported in 2009 [GAO, *Coast Guard, Better Logistics Planning Needed to Aid Operational Decisions Related to the Deployment of the National Security Cutter and Its Support Assets*, [GAO-09-947](#) (Washington, D.C.: July 17, 2009)], as a result of the increased capabilities of the National Security Cutters, the Coast Guard plans to replace 12 of the aging 378' High Endurance cutters that have been in service since the 1960s, with 8 National Security Cutters—however, only 5 National Security Cutters have been funded to date. The Offshore Patrol Cutter will complement the Coast Guard's legacy fleet and next-generation cutters to extend operational capabilities across the mission spectrum.

⁵⁰ The problem of infrastructure in the Arctic is not limited to the Coast Guard. Senior Coast Guard officials noted that the Arctic in general has limited infrastructure and almost no federal capacity.

example, the Coast Guard has no designated air stations north of Kodiak, Alaska—a city 948 miles or 8 helicopter flight hours and at least one fuel stop from Point Barrow, Alaska under favorable weather conditions. Additionally, once on scene in the Arctic, surface and air assets are limited by fuel capacity, distance to fuel sources, and crew rest requirements. Although there are limited cutter services for small vessels in Nome, the closest Coast Guard full-service facility to Barrow is located in Dutch Harbor in the Aleutian chain—almost 1,000 miles away.

In addition to a lack of infrastructure for air and surface assets, there is also a lack of housing facilities for Coast Guard personnel. For example, during the agency's temporary Arctic operations in the summer of 2009 in Prudhoe Bay and Nome, Coast Guard personnel were housed in a variety of public and private locations due to a lack of facilities. This particular lack of infrastructure also necessitates advance planning for any Arctic operations. For example, due to the remoteness of the Arctic region, a minimum of 18-24 hours lead time is needed to acquire and transport parts, equipment, and material to any Coast Guard operating location there.

Senior District 17 officials reported trying to find interim solutions to their infrastructure challenges. For example, to provide better response capabilities to remote Bering Sea locations—the hub of Alaskan fishing grounds—the Coast Guard deploys aircraft to forward operating locations in Cold Bay and St. Paul during the winter. To reduce costs for these operating locations, Coast Guard personnel in St. Paul have been staying in the Long Range Aids to Navigation station—one of the Coast Guard's most isolated and remote duty stations which was recently closed. Additionally, the Coast Guard has been leasing hangar space in Cold Bay for winter operations and has invested hundreds of thousands of dollars to upgrade the hangar. However, Coast Guard officials reported that both the hangar and housing options in Cold Bay remain inadequate. For example, according to Coast Guard documentation, the leased hangar in Cold Bay is inadequate to house two helicopters due to insufficient space for blade clearance, has structural problems, and lacks adequate heating for pilots. Also, as a cost savings measure in Cold Bay, two aircrews are using a house maintained by Alaska State Troopers. However, according to Coast Guard officials, this arrangement does not provide adequate lodging or dining facilities and is subject to the availability of the house. In an effort to retain Cold Bay as a forward operating location, in May 2009, District 17 submitted a revised proposal to Headquarters for a more limited, cost-effective structure in Cold Bay capable of holding two H-60 helicopters. District 17 officials reported in June 2010 that the project was endorsed by

the Coast Guard Commander for Pacific Area and sent to Coast Guard Headquarters for sequential clearance. However, District 17 officials reported that the earliest the project could begin is fiscal year 2012, and only after another fiscal year 2012 project has been pulled from the construction calendar. While this would provide a solution to infrastructure issues at Cold Bay, this location still only allows the Coast Guard to maintain a presence on the periphery of the Arctic.

Coast Guard Personnel Face Challenges Operating in the Arctic Due to Limited Training Opportunities

The Coast Guard has encountered difficulties allocating its personnel and other resources to accomplish all of its diverse missions while ensuring that it addresses personnel readiness, qualifications, and training requirements.⁵¹ This is also the case in the Arctic, where the Coast Guard faces challenges ensuring its personnel have adequate experience to navigate Arctic conditions.

The Coast Guard faces diminishing Arctic fleet experience due to limited icebreaker resources. A 2007 report from the National Research Council stated that new icebreakers would allow “the Coast Guard to reestablish an active patrol presence in U.S. waters north of Alaska to meet statutory responsibilities that will inevitably derive from increased human activity, economic development, and environmental change.” According to Coast Guard officials, the lack of capable U.S. icebreakers combined with the significant role that icebreakers have played supporting scientific missions, has limited the experience that Coast Guard personnel can gain conducting additional statutory missions in the Arctic. For example, the Coast Guard Commandant testified on July 16, 2008, that although the Coast Guard was able to conduct patrols with the icebreakers in May and June 2008—fisheries enforcement and Arctic Domain Awareness—he noted “I wish we could have done more. I wish we could have got deeper into the ice and spent a longer time there, because these competencies atrophy over time, and I am concerned that at a certain point, there won’t be a baseline level of competency to operate these ships.” Coast Guard Headquarters officials affirmed this view by stating that one of the key challenges facing the Coast Guard in the Arctic is the diminishing fleet expertise for operating in Arctic-type conditions. Although there are other domestic icebreakers—used primarily for Great Lakes icebreaking—due

⁵¹ For more on this see GAO, *Coast Guard: Service Has Taken Steps to Address Historic Personnel Problems, but It Is too Soon to Assess the Impact of These Efforts* [GAO-10-268R](#) (Washington, D.C.: Jan. 29, 2010).

to differences in ice conditions icebreaking aboard these vessels does not completely translate to the skill set needed for operating in Arctic ice conditions, according to Coast Guard program officials.

The Identification of Detailed Arctic Requirements Will Require Further Data and Take Considerable Time, and Funding Is Uncertain

As the Coast Guard plans for future Arctic operations, the agency faces the challenge of uncertainty over the time frame for the environmental and developmental changes taking place in the Arctic as well as uncertainty over future funding streams. While scientific research has indicated that the Arctic might have ice-diminished summers as early as 2040, there will likely continue to be variability in the quantity, location, and projections of ice cover, especially since recent data show the ice diminishing at a record pace. Additionally, there is still a need for more sophisticated Arctic ice models from NOAA and other agencies to improve the accuracy of predictions of future changes in sea ice. In the absence of a scientific consensus on a climate change time line, the Coast Guard may find it difficult to determine precisely when and how much to invest in an Arctic presence. In addition, the timing of oil and gas exploration and development in the Beaufort and Chukchi Seas could be affected by ongoing litigation, the public reaction to the Deepwater Horizon oil spill in the Gulf of Mexico, and the current moratorium on new drilling permits, among other things. These factors make it difficult for the Coast Guard to plan and dedicate the resources needed to meet future extraction activities.

Though various planning efforts are underway, the identification of detailed Arctic requirements (numbers and types of assets, dollars, and personnel required) will still take considerable time to complete and it may be many more years before detailed requirements translate into budget requests, congressional appropriations, acquisition activity, and, finally, assets and infrastructure that may be needed for Arctic operations. For example, the Coast Guard is studying how many polar icebreakers, with what capabilities, would be needed as replacements for Polar Star and Polar Sea.⁵² However, the first replacement polar icebreaker would not enter service for 8 to 10 years, by which time the Polar Star and Polar Sea would be over 40 years old—well past their intended service lives. Furthermore, the Coast Guard estimated in February 2008 that new

⁵² In addition, the DHS Office of Inspector General is currently assessing the Coast Guard's need for heavy-duty icebreakers to accomplish its missions.

replacement icebreakers could cost between \$800 and \$925 million each in 2008 dollars.

Given the resource-constrained federal budget environment, the Coast Guard's planning process, however thorough, to identify Arctic requirements will not guarantee that the Coast Guard's identified resource needs for the Arctic are met. The Commandant of the Coast Guard recognized the economic challenges when he testified in May 2009 on the Coast Guard's fiscal year 2010 budget request. He acknowledged that the Coast Guard could no longer do more with less, and would need to prioritize resource allocations, while accepting risk areas where resources would be lacking. In July 2009, we reported that while the Coast Guard's budget has increased significantly since 2003, the long-term budget outlook for the Service is uncertain.⁵³ Specifically, administration budget projections indicate that the DHS's annual budget is expected to remain constant or decrease over the next 10 years. As a result of this budget uncertainty, even if the results of the High Latitude Study show the need to increase Arctic resources, it may be a significant challenge for the Coast Guard to obtain them.

Coast Guard officials reported that they had gathered information on the changing Arctic and are evaluating future Arctic operations in order to be informed as they prepare themselves to move forward with Arctic plans. For example, Coast Guard officials commented that they consult with NOAA—the federal authority on climate change—on climate change projections and current weather-related data when projecting future Arctic-related plans. Additionally, the Coast Guard's High Latitude Study has taken into account the variations in climate change projections in the Arctic and will provide the Coast Guard with information on how its Arctic investments could change with respect to variability in the Arctic climate. The High Latitude Study should also help the Coast Guard to support its future funding requests related to its Arctic requirements by providing the supporting information necessary to validate its budget requests.

Conclusions

Determining a future course of action for Arctic operations presents the Coast Guard with significant challenges given the range and complexity of factors the agency must navigate in developing its plan. Uncertainty about

⁵³ See GAO, *Coast Guard: Observations on the Fiscal Year 2010 Budget and Related Performance and Management Challenges*, [GAO-09-810T](#) (Washington, D.C.: July 7, 2009).

when the Arctic will become navigable, the limited information on both current and future Arctic activity, and the difficulty of operating in a harsh environment and concerns about future funding—all contribute to planning challenges. Though its Arctic planning efforts are still formative, the Coast Guard has partnered with agencies and organizations that share an interest in the Arctic. This has allowed the Coast Guard to leverage resources and develop relationships that will likely play a key role as the agency develops its operations in this region. However, the Coast Guard's success in implementing an Arctic plan also rests in part on how successfully it communicates with key stakeholders, especially state and local officials, and Alaska Native tribal governments and interest groups. Coast Guard officials reported the agency's intent to develop a communication strategy to share information with Arctic stakeholders once it determined the agency's longer-term plans. Communicating these results, once known, is essential and we agree with this intent, but also believe it is important for the Coast Guard to begin to communicate now with key stakeholders about its ongoing planning process and related progress to keep stakeholders engaged in this process. We believe it is important in the public sector, and perhaps even more so with respect to Arctic issues given the many uncertainties, that policy making be transparent regarding the goals and outcomes to be achieved as well as the processes used in achieving them.

Recommendation for Executive Action

To maintain effective communication and relationships with stakeholders central to the Coast Guard's future Arctic operations, we recommend that the Commandant of the Coast Guard ensure that the agency communicates with these stakeholders on the process and progress of its Arctic planning efforts.

Agency Comments

We requested comments on a draft of this report from DHS, DOI, DOC, DOD, DOT, NSF, and State. The departments did not provide official written comments to include in our report. However, in an e-mail received September 9, 2010, the DHS liaison stated that DHS concurred with our recommendation. DHS, DOI, DOC, and NSF provided written technical comments, which we incorporated into the report as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to the Secretary of Homeland Security, the Secretary of Commerce, the Secretary of the

Interior, the Secretary of State, the Secretary of Transportation, the Secretary of Defense, the Acting Director of NSF, appropriate congressional committees and other interested parties. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you have any further questions about this report, please contact me at (202) 512-9610 or caldwells@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.

A handwritten signature in black ink, appearing to read "Stephen L. Caldwell", with a large checkmark at the end.

Stephen L. Caldwell
Director, Homeland Security and Justice Issues

Appendix I: Objectives, Scope, and Methodology

The objectives of our work were to determine the extent to which the Coast Guard is: (1) coordinating with stakeholders on Arctic issues and operations and what, if any, further opportunities exist to enhance coordination; (2) taking action to identify its requirements for future Arctic operations; and (3) taking steps to identify and mitigate Arctic challenges to meet current and future Arctic requirements.

To gather information for all three of these objectives we interviewed public and private sector representatives with operations or interests in the Arctic. We interviewed headquarters-based officials at the Coast Guard, National Science Foundation, U.S. Arctic Research Commission, and the Departments of State, Defense, and Commerce regarding the Coast Guard's efforts to prepare for increasing Arctic activity. To further understand the Coast Guard's coordination with Arctic stakeholders, efforts to identify Arctic requirements, and operational challenges in the Arctic, we conducted a site visit to Alaska where we interviewed field-based officials from seven federal departments and agencies with operations in the Arctic (Coast Guard, Department of Defense, National Oceanic and Atmospheric Administration, Bureau of Ocean Energy Management, Regulation and Enforcement,¹ Army Corps of Engineers, U.S. Arctic Research Commission, and the Denali Commission²), three Alaska state departments (Fish and Game; Natural Resources; and Commerce, Community and Economic Development), one Alaska Native interest group (Alaska Native Regional Corporation³), and six private or nonprofit organizations representing various Arctic interests including those related to shipping, cruise line activities, resource extraction, fishing, and environmental protection. We also conducted telephone interviews with representatives from two additional Alaska Native interest groups (Alaskan Eskimo Whaling Commission, Native Village of Barrow Inupiat Traditional Government), the Environmental Protection Agency,

¹ Secretarial Order 3302, issued June 18, 2010 renamed the Mineral Management Service to the Bureau of Ocean Energy Management, Regulation and Enforcement. The change was effective immediately.

² Introduced by Congress in 1998, the Denali Commission is an independent federal agency designed to provide critical utilities, infrastructure, and economic support throughout Alaska. With the creation of the Denali Commission, Congress acknowledged the need for increased interagency cooperation and focus on Alaska's remote communities.

³ Village and regional corporations were established pursuant to the Alaska Native Claims Settlement Act primarily as vehicles for distributing land and monetary benefits to Alaska Natives to provide a fair and just settlement of aboriginal land claims in Alaska. Pub. L. No. 92-203, 85 Stat. 688 (1971).

Alaska Division of Homeland Security and Emergency Preparedness, two representatives of Arctic local government, a nonprofit environmental protection organization, and an international cruise line association. Additionally, the team met with representatives of the International Maritime Organization (IMO) to discuss the development of Arctic regulations and guidance.⁴

To determine the extent to which the Coast Guard is coordinating with Arctic stakeholders on Arctic issues and operations and if additional coordination opportunities exist, we interviewed the above noted stakeholders due to their presence or involvement in the Arctic, reported interaction with the Coast Guard, and based on the recommendations of other Arctic stakeholders. Since we selected a nonprobability sample of Arctic stakeholders, the information obtained from these interviews cannot be generalized to all stakeholders but does provide for a broad overview of the types of Coast Guard coordination taking place on Arctic issues. We also reviewed documentation of the Coast Guard's Arctic coordination such as memorandums of understanding, Coast Guard records of contact with Alaska Native interest groups, and after-action reports. For the Coast Guard's interagency coordination on Arctic policy issues we identified how, if at all, each effort aligned with key practices we have identified for enhancing and sustaining interagency coordination. We also reviewed the Coast Guard's interagency coordination efforts against criteria in *Standards for Internal Control in the Federal Government* related to effective characteristics of program management.⁵ We did not evaluate the effectiveness of each interagency coordination effort but simply identified the key practices each effort is structured to address.

To determine the steps that the Coast Guard is taking to identify its future Arctic requirements we interviewed headquarters and field-based Coast Guard officials. On our site visit to Alaska we met with Coast Guard District 17 and Sector Anchorage officials responsible for all Coast Guard

⁴ The IMO is an organization of 160 member countries with observers from governmental, industry, environmental, public interest, and labor organizations that is concerned with the safety of shipping and cleaner oceans. To achieve its objectives, the IMO has promoted the adoption of some 30 conventions and protocols, and has adopted well over 700 codes and recommendations concerning maritime safety, the prevention of pollution, and related matters.

⁵ [GAO/AIMD-00-21.3.1](#).

operations in the state of Alaska.⁶ During this site visit we joined Coast Guard and other officials on a Coast Guard Arctic domain awareness flight which provided direct observation of how the agency is using one aviation asset to learn more about the Arctic environment.⁷ We also interviewed the above noted stakeholders to obtain their views on Coast Guard actions and understand the role that other Arctic stakeholders have had in helping the Coast Guard determine its Arctic mission requirements. We also reviewed Coast Guard documentation of its efforts to plan for increased Arctic activity including documents pertaining to the agency's High Latitude Study (the Coast Guard's ongoing analysis of current and future Arctic mission requirements) and after action-reports (reports that document an event or exercise to capture performance and suggest improvements). We reviewed our prior work on key steps and critical practices to implement the Government Performance and Results Act of 1993⁸ and determined how the Coast Guard's preliminary planning efforts align with these.

To determine the extent to which the Coast Guard is taking steps to identify and mitigate Arctic challenges to meet current and future Arctic requirements, we interviewed headquarters and field-based Coast Guard officials to discuss the Arctic operating environment, challenges to the Coast Guard's Arctic activities, and steps being taken to mitigate these challenges. On our site visit to Alaska we discussed these issues with Coast Guard District 17 and Sector Anchorage officials and observed Arctic-related assets and activities to further our understanding of the challenges the agency faces. Finally, we reviewed Coast Guard documents such as after-action reports and reports to Congress as well as research reports from the Arctic Council (*Arctic Marine Shipping Assessment*), National Academies, Congressional Research Service, and the National

⁶ Coast Guard Sectors run all missions at the local and port level, such as search and rescue, port security, environmental protection, and law enforcement in ports and surrounding waters, and oversee a number of smaller Coast Guard units, including small cutters, small boat stations, and Aids to Navigation teams. Coast Guard Districts oversee Sectors, other Coast Guard units, such as Air Stations, and major buoy tenders, among other assets. Sector Anchorage has the largest geographical Area of Responsibility in the nation, which includes the North Slope, Bering Sea, Chukchi Sea, Bristol Bay, Kodiak Island, Kenai Peninsula, and the Aleutian Islands.

⁷ Arctic domain awareness flights provide visibility on seasonal mining operations and coastal erosion while supporting the Coast Guard's homeland security mission, maritime domain awareness, and scientific research.

⁸ Pub. L. No. 103-62, 107 Stat. 285 (1993).

Oceanic and Atmospheric Administration, among others, to distill additional challenges and factors impacting the Coast Guard's Arctic operations.

We conducted this performance audit from September 2009 to September 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Examples of State, Local, and Alaska Native Stakeholders Operating in the Arctic

Table 2 describes key state, local, and Alaska Native stakeholders operating in the Arctic. The table provides information on the responsibilities of the stakeholders as well as examples of their work or locations in the Arctic. This is not an exhaustive list, but the table does give a sense of the many stakeholders and layers of responsibility that the Coast Guard must coordinate with in the Arctic.

Table 2: Examples of State, Local, and Alaska Native Stakeholders Operating in the Arctic

State, local or Alaska Native Arctic stakeholder		Arctic responsibilities
State of Alaska	Alaska Department of Fish and Game	This department is responsible for protecting, maintaining, and improving the fish, game, and aquatic plant resources in the state and managing their use and development in the best interest of the economy and well-being of the people of the state. For example, the department regulates commercial fishing.
	Alaska Division of Homeland Security and Emergency Management	This department provides critical services to the state to protect lives and property from terrorism and all other hazards, as well as to provide rapid recovery from all disasters. For example, the department tracks emergency planning efforts for Alaskan communities including those in the Arctic.
	Alaska Department of Environmental Conservation	This department's mission is to conserve, improve, and protect Alaska's natural resources and environment and control water, land, and air pollution, in order to enhance the health, safety, and welfare of the people of the state and their overall economic and social well being. For example, the department is responsible for mitigating the effects of oil spills and ensuring their cleanup in Northern Alaska.
Local government	Borough	The state is divided into 17 boroughs which function somewhat similarly to counties in other states. For example, Alaska's North Slope Borough encompasses 89,000 square miles of Arctic territory in northern Alaska.
Alaska Native interest groups and governments	Regional and village corporations	The Alaska Native Regional Corporations were established pursuant to the Alaska Native Claims Settlement Act, enacted into law in 1971, which settled land and financial claims made by the Alaska Natives and provided for the establishment of 13 regional corporations to administer those claims. For example, the Arctic Slope Regional Corporation represents eight Arctic villages including Barrow and Point Hope.
	Tribal village governments	At the village level, a federally recognized tribal government may coexist with a city government. For example, the Arctic village of Barrow has both a city government structure and a tribal government structure—the Native Village of Barrow Inupiat Traditional Government. In communities with both municipal and tribal governments, the state recognizes both as a local government and will work with both governments jointly or separately. There are currently 229 federally recognized tribal governments in Alaska.
	Alaska Eskimo Whaling Commission and Eskimo Walrus Commission	The mission of the Alaska Eskimo Whaling Commission is to safeguard the bowhead whale and its habitat and to support the whaling activities and culture of its member communities. The Eskimo Walrus Commission represents Alaska's coastal walrus hunting communities and is recognized statewide for working on resource co-management issues on behalf of Alaska Natives. Both of these groups safeguard the essential cultural, natural, and subsistence resources that are a significant part of their communities.

Source: GAO.

Appendix III: Examples of Coast Guard Coordination with Key Federal, State, Local, Alaska Native, and Private Sector Stakeholders

Table 3 provides information on the key agencies and organizations that the Coast Guard coordinates with on Arctic operations. The table outlines additional coordination activities between the Coast Guard and each agency or organization. This is not an exhaustive list; the Coast Guard also coordinates with other agencies.

Table 3: Examples of Coast Guard Coordination with Key Federal, State, Local, Alaska Native, and Private Sector Stakeholders in the Arctic

Stakeholder	Example of coordination with the Coast Guard
Federal government	
Department of Defense (DOD)	<ul style="list-style-type: none"> The Coast Guard coordinates with various DOD entities to conduct joint operations and leverage existing resources. For example, the Coast Guard coordinates with: (1) Joint Task Force-Alaska in support of a unified approach to the security and defense of Alaska; (2) Navy's Meteorological and Oceanographic Command for marine weather observation and reporting in the Arctic; (3) Air Force and Army components, Alaska Air National Guard and the Alaska Army National Guard, coordinate closely with the Coast Guard's command centers and aircrews on rescue missions in Alaska. In addition, under a long-standing agreement with the Navy, the Coast Guard operates the nation's icebreakers and uses them, when requested, to support the Navy.
Department of Commerce's National Oceanic and Atmospheric Administration (NOAA)	<ul style="list-style-type: none"> The Coast Guard coordinates with several NOAA offices to receive scientific and technical support for operations in the Arctic. NOAA provides meteorological data such as average temperatures and water levels, weather forecasts, nautical charts, and global positioning system data. During an oil spill, NOAA delivers expert scientific support to the Coast Guard in its role as Federal On-Scene Coordinator. NOAA, the U.S. Navy, and the Coast Guard aid the navigation of U.S. assets in ice-infested waters through the National Ice Center. The Coast Guard coordinates with NOAA's National Marine Fisheries Service to manage and protect fisheries. The National Marine Fisheries Service and Coast Guard District 17 interact regularly as members of the North Pacific Fishery Management Council—one of eight regional councils established to oversee management of the nation's fisheries. In 2009 the North Pacific Fishery Management Council recommended, and National Marine Fisheries Service approved, the Arctic Fishery Management Plan, which prohibits commercial fishing until sufficient information is available to enable a sustainable commercial fishery. The Coast Guard is the agency responsible for its enforcement.
Department of the Interior's Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE)	<ul style="list-style-type: none"> BOEMRE and the Coast Guard coordinate on civil penalties, accident investigations, and oil spill planning, preparedness, and response. According to BOEMRE officials in Alaska, coordination with the Coast Guard takes place: (1) when BOEMRE approves oil companies' contingency plans and provides a courtesy copy to the Coast Guard; (2) in field demonstrations to verify equipment and issue certifications (i.e., oil spill removal organizations, vessels, and mobile offshore drilling units) to drilling companies; and (3) for Coast Guard and BOEMRE -sponsored research on oil spill responses.

**Appendix III: Examples of Coast Guard
Coordination with Key Federal, State, Local,
Alaska Native, and Private Sector
Stakeholders**

Stakeholder	Example of coordination with the Coast Guard
National Science Foundation (NSF)	<ul style="list-style-type: none"> • The Coast Guard coordinates with NSF on the use of polar icebreakers in support of enhanced awareness of the Arctic region. • In 2005, NSF and the Coast Guard signed a memorandum of agreement (superseding their 1999 agreement) for the use of Coast Guard icebreakers for science and operational support of programs funded by NSF. The agreement was entered into after budget authority for the Coast Guard's polar icebreakers was transferred to NSF.
State, local, and Alaska Native government	
State of Alaska	<p>The Coast Guard has coordinated with</p> <ul style="list-style-type: none"> • the Department of Fish and Game through bimonthly teleconferences focused on fisheries enforcement; • the Alaska Department of Homeland Security through Joint Terrorism Task Force meetings; and • the Department of Environmental Conservation through the Alaska Statement of Cooperation, a partnership agreement to work cooperatively to identify and respond to environmental issues and concerns in Alaska.
Local government	<p>The Coast Guard has coordinated with</p> <ul style="list-style-type: none"> • the North Slope Borough through annual regional planning meetings to discuss Coast Guard's summer operations, among other things; • the City of Nome on search and rescue; and • local leaders to arrange Coast Guard boating safety awareness training in North Slope villages.
Alaska Native governments and interest groups	<p>The Coast Guard has coordinated with</p> <ul style="list-style-type: none"> • the Native village of Kivalina to address coastal erosion issues; • the Alaska Eskimo Whaling Commission to plan Coast Guard activities so that subsistence hunting is not interrupted; • the Native villages of Unalakleet, Kwigillingok, Koyuk, and Kotzebue to maintain buoys that mark the approaches to these native villages; • Alaska tribal leaders and senior military leaders by attending the annual Tribal-Military Leaders Meeting; and • Tribal leaders in northwest and northern Alaska to discuss the local impacts of climate change and resource development.
Private sector	
Private industry (oil/gas, fishing, shipping, cruise lines)	<p>The Coast Guard has coordinated with</p> <ul style="list-style-type: none"> • the Alaska Oil and Gas Association, which provides a forum for communication between oil and gas industry and cooperation with members, the public, and local, state, and federal government to learn about industry plans on the North Slope; • the Marine Conservation Alliance, which supports the Alaskan fishing industry and those who are directly or indirectly involved in the North Pacific (Alaska) fisheries to share information on fishery management; • Cruise Line Agencies of Alaska, which coordinates and advises cruise ships on a variety of issues including customs and immigration, transporting staff and passengers, and outfitting cruise ships for activity in the Arctic; and • other industry representatives, such as Shell Oil Company officials, to share information on the location of oil extraction vessels, time line of operations, and private search and rescue capabilities.

Source: GAO.

Appendix IV: Select Interagency Coordination Efforts Related to Arctic Policy

Table 4 provides information on key forums for interagency coordination on Arctic policy and the key practices these coordination efforts incorporate, which are not discussed in the body of this report.

Table 4: Select Interagency Coordination Efforts Related to Arctic Policy

Lead and key participating agencies	Establishment and purpose	Example actions or accomplishments	Key interagency coordination practices incorporated
Interagency Arctic Research Policy Committee			
Lead agency: Office of Science and Technology Policy Key participants: National Science Foundation (Chair), Departments of Commerce, Defense, State, Health and Human Services, Homeland Security, Office of Science and Technology Policy, Agriculture, Energy, Interior, Transportation, National Aeronautics and Space Administration, Environmental Protection Agency, Smithsonian Institution, National Endowment for the Humanities	Established by the Arctic Research and Policy Act of 1984, this committee helps set priorities for future Arctic research; works with the Arctic Research Commission to develop and establish an integrated national Arctic research policy to guide federal agencies; develops a 5-year plan to implement the national policy, and updates the plan biennially, among other things. On July 22, 2010, President Obama issued a Presidential Memorandum that assigns responsibility for specific Arctic research activities to the National Science and Technology Council. As a result, the Interagency Arctic Research Policy Committee will become a subcommittee under the Committee on Environment and Natural Resource, which is one of the four primary National Science and Technology Council committees.	In April 2007 this committee compiled member agency information about the Arctic environment in a report, Arctic Observing Network: Toward a US Contribution to Pan-Arctic Observing. The report pinpoints where and how the different federal agencies are collecting environmental data in the Arctic.	Define and articulate a common outcome; establish mutually reinforcing or joint strategies; agree on roles and responsibilities; and establish means of operating across agency boundaries.
U.S. Extended Continental Shelf Task Force			
Lead agency: State Department Key participants: NOAA and the Department of the Interior (co-vice chairs); the U.S. Geological Survey, the Executive Office of the President, the Joint Chiefs of Staff, U.S. Navy, Coast Guard, Energy, National Science Foundation, Environmental Protection Agency, Department of Interior's Bureau of Ocean Energy Management, Regulation, and Enforcement, and the U.S. Arctic Research Commission	In April 2007, the White House's Interagency Committee on Ocean Science and Resource Management Integration established the Extended Continental Shelf Task Force. The task force coordinates the collection and analysis of relevant data and prepares the necessary documentation to establish the limits of the U.S. continental shelf in accordance with international law. The Coast Guard conducts data-gathering cruises in the Arctic and National Oceanic and Atmospheric Administration, in collaboration with other partners, uses the data to map the ocean floor.	The Coast Guard and the National Oceanic and Atmospheric Administration have collected data from cruises in the Arctic Ocean in 2003, 2004, and 2007 to 2009. The 2009 U.S. - Canada Arctic Continental Shelf Survey mission was a 41-day mission involving Coast Guard and Canadian icebreakers to collect scientific data about the extended continental shelf and Arctic seafloor. The two nations plan to work together again in the summer of 2010.	Define and articulate a common outcome; establish mutually reinforcing or joint strategies; agree on roles and responsibilities; and establish means of operating across agency boundaries.

**Appendix IV: Select Interagency Coordination
Efforts Related to Arctic Policy**

Lead and key participating agencies	Establishment and purpose	Example actions or accomplishments	Key interagency coordination practices incorporated
Committee on the Marine Transportation System (CMTS)			
<p>Lead agency: Department of Transportation</p> <p>Key participants: Approximately 25 federal agencies including the Coast Guard; State; U.S. Army Corps of Engineers; National Oceanic and Atmospheric Administration; Maritime Administration; Environmental Protection Agency; Department of Interior; Federal Maritime Commission; Department of Energy; Office of Management and Budget; Office of Science and Technology Policy; Council on Environmental Quality; and National Security Council</p>	<p>This committee was established as the result of a directive in the U.S. Ocean Action Plan, issued December 17, 2004. Effective August 2005, the CMTS's mission is to ensure the development and implementation of national Marine Transportation System policies consistent with national needs and to report to the President its views and recommendations for improving the system.</p>	<p>The CMTS Coordinating Board approved the development of a U.S. Arctic Marine Transportation Integrated Action Team, co-chaired by the National Oceanic and Atmospheric Administration and Maritime Administration, in January 2010 to facilitate cross-federal agency coordination to strengthen the marine transportation system in the U.S. Arctic region, in the areas of safety, security, reliability, and economic and environmental sustainability of the system. The Integrated Action Team drafted a work plan which included the completion of an inventory and gap analysis of federal agencies' Marine Transportation System-related activities in the Arctic.</p>	<p>Define and articulate a common outcome; establish mutually reinforcing or joint strategies; agree on roles and responsibilities; establish means of operating across agency boundaries; develop mechanisms to monitor, evaluate, and report on results; and reinforce agency accountability for collaborative efforts through agency plans and reports.</p>
Arctic Policy Group			
<p>Lead agency: State Department</p> <p>Key participants: Departments of the Interior, Energy, Commerce (National Oceanic and Atmospheric Administration), Transportation (Federal Aviation Administration), and Homeland Security (Coast Guard), Environmental Protection Agency, National Science Foundation, U.S. Arctic Research Commission, and the State of Alaska</p>	<p>Established in 1971, the Arctic Policy Group coordinates U.S. positions on international Arctic issues and, as such, leads U.S. participation in the Arctic Council.</p>	<p>The Arctic Policy Group meets once a month to discuss Arctic Council issues as well as other Arctic issues.</p>	<p>Define and articulate a common outcome; establish mutually reinforcing or joint strategies; agree on roles and responsibilities; and establish means of operating across agency boundaries.</p>

Source: GAO.

Appendix V: Coast Guard's Routine Arctic Operations That Also Inform Future Requirements

This appendix provides additional information on some of the Coast Guard's routine Arctic operations—icebreaking missions, search and rescue cases, marine environmental protection responses, and Aids to Navigation maintenance—that provide further insight into the agency's future Arctic requirements. For example:

Ice Operations: The mission of the Coast Guard's polar icebreakers—the Polar Sea, Polar Star, and the Healy—is to conduct and support scientific research, defend U.S. sovereignty and other U.S. interests in Polar regions, monitor sea traffic in the Arctic, and conduct other Coast Guard missions such as search and rescue. However, for many years these polar icebreakers have spent most of their time conducting and supporting scientific research. These research activities have resulted in greater insight on climate change, ocean floor mapping, and other data which Coast Guard officials report are helping to inform their Arctic requirements.¹ For example, Coast Guard icebreakers collect real-time satellite imagery, which researchers from the international Arctic research community use to investigate the effects of climate change and ice conditions. In another example, as mentioned previously, over the past 3 years the Coast Guard has carried out joint scientific cruises with the Canadian Coast Guard to map portions of the Arctic Ocean floor and prepare both nations for potential extended Exclusive Economic Zone claims in the region.

Coast Guard officials note that the broadening scope of U.S. interests in the Arctic may shift heavy icebreaker utilization from a scientific support focus to a more multimission role to align with these broadening interests. Coast Guard officials also reported that an expansion of the demands on the Coast Guard's polar icebreakers may exacerbate some of the agency's existing icebreaking resource challenges. For example, Coast Guard officials reported challenges fulfilling the agency's statutory icebreaking mission, let alone its standing commitment to use the icebreakers to support the Navy as needed, because (1) the budget and schedule for icebreaker operation has in recent years been managed by the National Science Foundation, (2) there is a limited number of U.S. polar icebreakers, and (3) two of the three Coast Guard icebreakers are currently experiencing operational problems. The Polar Star has not been in operational condition since July 2006 and is currently undergoing a 30-

¹ The Department of Homeland Security's Office of Inspector General is currently assessing the Coast Guard's need for heavy-duty icebreakers to accomplish its missions.

month \$62.8 million rehabilitation to extend its service life by approximately 7 to 10 years.² According to the Coast Guard, the Polar Star will not be operational for deployment until 2013. In addition, in June 2010 the Coast Guard announced that the Polar Sea had engine problems and would be unavailable for operation until at least January 2011. The Coast Guard has estimated that a new replacement icebreaker could cost between \$800 million and \$925 million (in 2008 dollars) and require around 10 years to design, award, and build.

Search and Rescue: Coast Guard officials reported that their experience deploying assets to respond to search and rescue incidents above the Arctic Circle highlighted the asset and personnel requirements for operating in this harsh region. For example, Coast Guard officials reported having minimal search and rescue capacity above the Arctic Circle. The agency's closest aviation assets are in Kodiak, Alaska, over 800 miles or about 8 hours helicopter flight time away from the North Slope—too far away to be useful in an urgent life or death situation.

In addition, due to the Coast Guard's limited assets above the Arctic Circle the agency sometimes relies on third party responders. For example, in July 2007 a Shell Oil Company helicopter and Canadian Coast Guard cutter assisted a 20-foot skiff near Barrow, Alaska and in September 2009 an Alaska Clean Seas vessel evacuated a medical patient from a cruise ship near Prudhoe Bay, Alaska.³ Coast Guard officials report that although the number of search and rescue cases above the Arctic Circle has been relatively low, these experiences provided valuable information on Coast Guard and third party search and rescue assets and capabilities in the Arctic which helps them to determine future needs in the region. Coast Guard officials expect that the demand for search and rescue will grow with increasing Arctic maritime traffic.

² Congressional direction accompanying the DHS Appropriations Act, 2010 (Pub. L. No. 111-83, 123 Stat. 2142 (2009)) specified that of additional funding provided, that \$5.2 million is funded in the AC&I direct personnel costs, PPA (program, project, and activity), and within that amount, the Coast Guard shall begin survey and design and conduct a business case analysis for either a new heavy polar icebreaker class or a major life extension project for existing heavy icebreakers (H.R. Conf. Rep. No. 111-298, at 89 (2009)) incorporating direction specified in Senate Report No. 111-31, at 78 (2009)).

³ Alaska Clean Seas is a non-profit cooperative that provides response services to numerous other oil and gas companies on Alaska's North Slope.

Marine Environmental Protection: Coast Guard officials report that as of July 2010 the agency has not had to respond to any oil or hazmat spills in waters above the Arctic Circle, but the agency's experience responding to incidents in more southern Arctic waters has provided insight into the agency's future Arctic requirements. For example, Coast Guard officials explained that their response to the December 2004 grounding of a 738-foot freighter—the Selendang Ayu—highlighted the logistical challenges of getting personnel and assets on scene in an area with limited infrastructure.⁴ Figure 6 shows the view from an overflight to search for possible spilled oil after the vessel broke in two. According to Coast Guard officials, this incident created the second largest oil spill in Alaskan history. Coast Guard officials stressed that a response to a similar incident above the Arctic Circle would be even more difficult due to the limited infrastructure—hangars, ports, communications systems, berthing—and minimal Coast Guard assets operating in the remote Arctic regions. The former Coast Guard District Commander in Alaska stressed that as commercial vessel and barge traffic grows in northern and western Alaska, the Bering Strait will become the newest chokepoint on the planet and each large vessel will pose a “Selendang” risk to the U.S. Arctic.

⁴ The Selendang Ayu ran aground off of Unalaska Island in the Aleutian Chain, broke in two, and spilled its cargo of soybeans and approximately 336,000 gallons of oil.

Figure 6: The Grounding of the Vessel *Selendang Ayu* in the Aleutian Chain



Source: Alaska Department of Fish and Game.

In addition, the Coast Guard's current District Commander in Alaska told us that responding to a large oil spill in the Arctic caused by an incident such as a vessel collision in the Bering Strait was one of his biggest Arctic concerns and the former Commandant of the Coast Guard has also publicly commented on the agency's limited response resources and capabilities to address a major spill in the Arctic Ocean. Recognizing these limitations, Coast Guard District 17 and Sector Anchorage plan to conduct an Ecological Risk Assessment—a consensus building exercise for federal, state, local and tribal responders to evaluate the relative harm of oil spill clean-up strategies on the marine and human environment—along a stretch of Arctic coastline near Kivalina beginning in winter of 2010.⁵ Once complete, the assessment data will be available for refining existing oil spill contingency plans.

Another effort which provided insight into the Coast Guard's future Arctic requirements with regard to oil spills was a March 2010 tabletop exercise involving federal, state, tribal, and local leaders in the United States and

⁵ The assessment team is made up of federal and state response agencies, Alaska Native villages, subsistence groups, and commercial waterway users, among others.

Canada, including the U.S. and Canadian Coast Guards. As mentioned previously, the 2010 CANUSNORTH tabletop exercise was a 2-day event to practice a joint response to an oil spill on the U.S.-Canada border in the Arctic. The exercise's objective was to raise awareness of the challenges associated with an oil spill response in the Beaufort Sea and Canadian Arctic region and to improve joint response operations between the United States, Canada, and regional stakeholders. The after-action report for this exercise identified both strengths and areas for improvement such as the need to learn more about waste disposal methods in the Arctic and the need to verify the usability of existing dormant runways along the North Slope region.

The Coast Guard and others have limited scientific information on how oil behaves in icy environments but several research efforts are underway which may help inform the Coast Guard's Arctic requirements. Officials from the Coast Guard, NOAA, and other agencies have noted the general lack of information on how oil behaves in icy environments, which is important for conducting injury assessments and developing response and restoration strategies. Coast Guard and NOAA officials told us that the most prominent research on the properties of spilled oil in icy water and the effectiveness of potential response techniques has been conducted by a joint industry program coordinated by the Norwegian research company SINTEF. The SINTEF researchers obtained permission from the Norwegian government to put actual crude oil into the sea in carefully controlled conditions, thus enabling the testing of oil behavior and cleanup effectiveness in ice conditions closely similar to those that might be encountered in an Arctic oil spill emergency. According to Bureau of Ocean Energy Management, Regulation, and Enforcement officials, their Technology Research Assessment Program funds and conducts state-of-the-art cold-water spill response research in collaboration with the Coast Guard, SINTEF, and others. In addition, Coast Guard officials report that the agency's Research and Development Center has an ongoing project to develop oil-in-ice response technology.⁶ Coast Guard officials stated that the Norwegian research and other oil-in-ice research efforts improve their

⁶ In addition, the Coast Guard chairs the Interagency Coordinating Committee for Oil Pollution Research, which is tasked with preparing a federal oil pollution research and development plan and promoting cooperation among industry, universities, research institutions, state governments, and other nations through information sharing, coordinated planning, and joint funding of oil pollution research projects. The committee currently serves as a forum for its federal members to coordinate oil pollution research activities, but no funding has been appropriated by Congress since 1995.

understanding of the agency's future Arctic requirements for marine environmental protection.

Aids to Navigation: The Coast Guard reports that it currently maintains 37 Aids to Navigation—such as buoys, lights, and signs—along the Western coast of Alaska and plans to reestablish its only Aid to Navigation above the Arctic Circle in August 2010.⁷ Coast Guard officials have learned from their experience maintaining Aids to Navigation in Alaska that Arctic ice conditions complicate the deployment of aids; there is a lack of basic data to inform aid placement and heavy ice conditions make it difficult to keep water-based aids in fixed position. Coast Guard officials reported that due to these difficulties, all Aids to Navigation in the region are land-based and the agency would need to invest more resources—time, cutters, and money—to maintain floating Aids to Navigation in the Arctic. District 17 officials reported that water-based Aids to Navigation are needed because the waters immediately offshore the Arctic coast are typically very shallow and marine traffic often needs to remain 8-10 nautical miles (or farther) offshore. According to Coast Guard officials, at this distance, a typical land-based Aids to Navigation is not visible. In 2008 and 2009 the Coast Guard conducted waterways analysis trips to the Arctic to determine current and future Aids to Navigation needs in some parts of the Arctic.⁸ Coast Guard personnel have also interviewed regional experts to determine hazards, needs, and typical waterways to inform their decisions about which areas need greater attention, new aids, or both. Coast Guard District 17 officials described the need to deploy seasonal Aids to Navigation infrastructure; research technical solutions to power unmanned lighted Aids to Navigation in Arctic regions; develop competency in servicing non-solar-powered aids; develop skills in

⁷ The Coast Guard has statutory authority to operate and maintain a system of maritime aids to facilitate navigation and to prevent disasters, collisions, and wrecks. In September 2006 we reported that to fulfill this mission, the Coast Guard operates over 53,000 aids. These Aids to Navigation are like road signs of the waterways and are placed along coasts and navigable waters as guides to mark safe water and to assist mariners in determining their position in relation to land and hidden dangers. These aids consist of both floating aids, such as buoys, and fixed aids, such as lights or signs mounted on pilings. For more on this see GAO, *Coast Guard: Condition of Some Aids-to-Navigation and Domestic Icebreaking Vessels has Declined; Effect on Mission Performance Appears Mixed*, [GAO-06-979](#) (Washington, D.C.: Sept. 22, 2006).

⁸ Waterways Analysis and Management System studies ensure that current aids are necessary elements of the Aids to Navigation system in particular waterways. They also evaluate the aids to determine their effectiveness, which often leads to alterations of technical aspects of the aids and establishment or disestablishment of aids in order to meet changing needs in waterways.

designing, constructing, and maintaining year-round aids in the shallow water off Alaska's North Slope; and work with the International Maritime Organization to establish a Bering Strait traffic management scheme.⁹ According to Coast Guard officials, an increase in Arctic vessel traffic may increase the importance of Aids to Navigation to prevent disasters, collisions, and wrecks in the region.

⁹ A Bering Strait traffic management scheme would separate traffic with "lanes" to reduce the likelihood of collisions or other casualties.

Appendix VI: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

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